Vol. 34 No 12

BULLETIN

OF THE

TORREY BOTANICAL CLUB

DECEMBER, 1907

A new Utricularia from Long Island

JOHN HENDLEY BARNHART

(WITH PLATE 34)

One September day, six years ago, while I was walking along the shore of a small pond near Riverhead, on Long Island, I observed a small colony of plants of a terrestrial *Utricularia*. At first sight it appeared different from any species previously reported from the northeastern United States; as a careful study of the fresh material confirmed this view, another visit was made to the locality a few days afterward and the plant collected as liberally as consideration for the perpetuation of the single small patch would permit. The bladderworts, however, are very fickle, appearing and disappearing in a given place from year to year, and several subsequent visits to the original locality have failed to bring this plant to light again.

Although the species was apparently new, and careful notes had been made upon the fresh material and a fair quantity of herbarium material collected, publication was deferred in the hope that further collections might be made. Two years later, Mr. Bicknell brought in from Woodmere, Long Island, for the herbarium of the New York Botanical Garden, specimens of the same *Utricularia*, in flower. Meanwhile my own material had been mislaid, and when it was located again, a few months ago, it seemed best no longer to delay the publication of the novelty.

The species here proposed as new belongs to a group which has comprised, in our northeastern flora, only two species, *U. cornuta* Michx. and *U. juncea* Vahl. They agree in having

[The BULLETIN for November, 1907 (34: 533–578, *pl. 31–33*) was issued 11 Ja 1908.]

strictly erect scapes, "rooting" in mud (there are no true roots in *Utricularia*, these root-like organs being actually caulome); stems radiating from the bases of the scapes, extremely slender and delicate, so that they usually break off short and are very rarely collected; some of the leaves filiform, root-like, and bladder-bearing, others linear and resembling minute blades of grass; flowers subspicate, the pedicels being shorter than the bracts; bracts trifid; and palate of the corolla laterally compressed, not lobed.

Utricularia virgatula sp. nov.

Stems extremely delicate, radiating from the base of the scape, on or just beneath the surface of the soil: leaves scattered, undivided, linear, 4–8 mm. long, some erect, green-tipped, and bladderless, others root-like, colorless, and bladder-bearing: scapes fixed in the mud, erect, wiry, brownish, 2–20 cm. long; scales several, minute, acute; bracts minute, less than 1 mm. long, trifid, the middle lobe much broader than the lateral ones: flowers 1–6, subsessile: calyx purplish, the upper lobe broadly ovate, acuminate, 4 mm. long, the lower ovate, acute, only half the width of the upper, 2.5 mm. long: corolla yellow; upper lip spatulate, emarginate, barely if at all exceeding the upper calyx-lobe; lower lip about the length of the upper, entire, apiculate, consisting almost wholly of the laterally compressed palate, with a minute tuft of hairs in the throat; spur pendent, conical, acute, 2–3 mm. long: capsule subspherical, 1.5–2 mm. in diameter, purplish, closely invested by the persistent calyx-lobes, and slenderly beaked by the acuminate upper one; placenta spherical, stipitate, seed-bearing throughout: seeds very minute and numerous (about 750 in each capsule), oval in outline, the surface prominently reticulate.

NEW YORK: Near Riverhead, Suffolk County, September 4–13, 1901, *J. H. Barnhart* (type, in the author's herbarium); Woodmere, Nassau County, September 13, 1903, *E. P. Bicknell* (in the herbarium of the New York Botanical Garden).

The following material may also be referred here, with some doubt:

NEW JERSEY: Cold Spring, Cape May County, August 20, 1891, *Stewardson Brown* (in the herbarium of the Academy of Natural Sciences of Philadelphia, sheet no. 502,805).

Of our northeastern species, *U. virgatula* is most closely related to *U. juncea*, its most striking differences being the small size of its scapes, and its miniature corollas, the largest barely exceeding

the calyx, while those of *U. juncea* are conspicuous. *U. juncea* is a species of distinctly southern range, and has not been hitherto reported as occurring on Long Island, as far as I am aware. It was found by me, however, in September of the present year (1907), near Riverhead, in a pond adjoining that from which *U. virgatula* was first taken.[8] Its occurrence on Long Island is not at all remarkable, but it is surprising that it has so long escaped detection.

Closer still is the relationship of *U. virgatula* to the *U. simplex* of Charles Wright, first described from Cuba, and since reported from Florida. The resemblance is indeed so close that I am unable to name any character by which they may be distinguished. However, the name *U. simplex* has been in use for nearly a hundred years for an entirely different Australian species (*U. simplex* R. Br.), so that Wright's species is without any tenable name; instead of renaming it, it seems better to refer the material from Cuba and Florida provisionally to *U. virgatula*. If future comparisons should prove that the southern material is distinct, it will then be necessary to assign it a new name.

It might seem unreasonable to suggest that a gamopetalous spermatophyte found in Florida could be conspecific with one found in New Jersey, no intermediate stations being known; yet as a parallel case may be cited another species of the same genus. *U. resupinata* B. D. Greene was discovered about seventy-five years ago in eastern Massachusetts; one by one other localities came to light, until now it has been found in every one of the New England States, New York, New Jersey, Pennsylvania, Michigan, and Indiana. The same species, or one so closely resembling it that no one has yet distinguished it, is now known to be fairly common in Florida, and has been collected in southern Georgia; but no stations are known intermediate between these extreme southern ones and those in New Jersey, Pennsylvania, and Indiana.

In several of his published papers (Bull. Torrey Club **30**: 323, 324; Rhodora **7**: 72, 73), Dr. Roland M. Harper has called attention to similar apparent breaks in the distribution of various other flowering plants, such as *Rynchospora fusca*, *Eleocharis Robbinsii*, *Cladium mariscoides*, *Eriocaulon septangulare*, and *Habenaria blephariglottis*.

NEW YORK BOTANICAL GARDEN.

Explanation of plate 34

UTRICULARIA VIRGATULA sp. nov.

1, 2, 3. Entire plants, natural size.
4, 5. Trifid bract, × 8.
6. Capsule, with sheathing calyx, × 8.
7. Flower, × 8.
8. Corolla, × 8.
9. Gynoecium and androecium, × 8.
10. Portion of stem with two leaves, one bladder-bearing, the other bladderless, × 8.
11. Bladder, × 50.

New species of Uredineae—VI

JOSEPH CHARLES ARTHUR

The following fifteen species of rusts are in part new discoveries, and in part well known forms that have not before been specifically named and characterized. They are placed on record in order to facilitate the work of preparation for the systematic treatment of the order in the North American Flora, the final parts of which are now being written. The kindness of those who have contributed specimens is much appreciated. The hearty coöperation of numerous correspondents tends to insure a reasonably full treatment in the forthcoming work.

An error in the preceding number of this series may be pointed out here. The type specimen of *Uredo Holwayi* (Bull. Torrey Club **33**: 518. 1906) is on *Tsuga heterophylla* (Raf.) Sarg. The error was due to a confusion in the mind of the writer of the characters belonging to the two species of hosts. *T. heterophylla* is the lowland hemlock, which was formerly referred to the eastern *T. canadensis*. Both it and the alpine hemlock are found in the vicinity of Glacier, B. C. Professor Holway, who was in the Selkirks from July to September of 1907, reported the rust at the time very abundant on the lowland species, but rare on the other. He has sent a specimen on *T. Mertensiana*, collected at Glacier, B. C., August 18, 1907.

Puccinia cinerea sp. nov.

O and I. Pycnia and aecia unknown.

II. Uredinia hypophyllous, scattered, oblong, small, 0.1–0.3 mm. wide by 0.5–1.5 mm. long, tardily naked, pulverulent, orange-yellow, ruptured epidermis conspicuous; urediniospores broadly ellipsoid, 18–23 × 23–29 μ, wall pale-brown, about 1.5 μ thick, finely and inconspicuously echinulate, pores 5 or 6, scattered.

III. Telia compound, amphigenous, scattered, oblong, small, 0.1–0.2 mm. wide by 0.5–1 mm. long, long covered by the epidermis, cinereous, surrounded by a thin stroma; teliospores oblong or oblong-clavate, irregular by compression, 16–21 × 40–60 μ, wall dark cinnamon-brown, 1–1.5 μ thick, thicker at apex, 3 5 μ, smooth; pedicel short, tinted.

On *Poa nevadensis* Vasey, Fort McKinney, Wyoming, August, 1898, *Williams & Griffiths* (Griff. W. Am. Fungi *355*; type); *P. arida* Vasey, Wood River, Nebraska, July 28, 1906, *J. M. Bates 3930*, Loup City, Nebraska, June 22, 1907, *J. M. Bates; Poa* sp., Billings, Montana, September, 1898, *Williams & Griffiths* (Griff. W. Am. Fungi *355a*); Piedmont, Wyoming, August 4, 1901, *L. H. Pammel 2179*. The species resembles *Puccinia epiphylla* (L.) Wettst. (*P. Poarum* Niels.), but in the uredinial stage is readily distinguished by the slightly larger spores and absence of paraphyses, and in the telial stage by the more pronounced stroma, paler sori and larger teliospores. Rev. J. M. Bates has found it a number of times growing intermixed with *Oxygraphis Cymbalaria* (Pursh) Prantl, bearing aecia, and suggests that the two forms may be genetically related.

Puccinia perminuta sp. nov.

O and I. Pycnia and aecia unknown.

II. Uredinia amphigenous or only epiphyllous and caulicolous, scattered, oval, small, 0.1–0.3 mm. long, tardily naked, pale-yellow, pulverulent, ruptured epidermis noticeable; urediniospores globoid or broadly ellipsoid, 15–18 × 16–22 μ, wall very pale-yellow, thin, 1 μ or less, sharply echinulate, pores about 6, scattered, obscure.

III. Telia amphigenous or only epiphyllous and caulicolous, oval, small, 0.1–0.3 mm. long, often confluent, covered by the epidermis, blackish; stroma usually wanting; teliospores oblong, 12–16 × 25–39 μ, slightly or not constricted at septum, obtuse at both ends, wall chestnut-brown, smooth, thin, 1–1.5 μ, much thickened above, 5–10 μ, concolorous; pedicel very short, colored.

On *Agrostis hyemalis* (Walt.) B.S.P., Sugar Grove, Ohio, September 23, 1905, *W. A. Kellerman 4299* (type); Houston, Texas, April 17, 1869, *H. W. R*[*avenel*], uredinia only (specimen in herbarium of U. S. Department of Agriculture, said to be on *Trichodium*); *A. perennans* (Walt.) Tuckerm., Durbin, Pocahontas County, West Virginia, August 28, 1902, *W. A. Kellerman 3960*. The species differs from *P. Agrostidis* Plow. in the smaller spores of both sorts, and a less development of stroma, and in other less prominent characters. No one has yet made a suggestion as to its probable aecial connection.

Puccinia praegracilis sp. nov.

O. and I. Pycnia and aecia not definitely known.

II. Uredinia amphigenous, scattered, oblong, small, 0.1–0.2 mm. wide, by 0.2–0.3 mm. long, soon naked, pale-yellow, pulverulent, ruptured epidermis barely noticeable; urediniospores broadly ovoid, 16–19 × 18–21 μ, wall rather thin, about 1 μ, pale-yellow, closely and minutely echinulate, pores about 6, scattered, obscure.

III. Telia amphigenous, oblong or linear, 0.1–0.3 mm. wide, by 0.3–1 mm. long, irregularly confluent, covered by the epidermis, purplish-black; stroma none; teliospores oblong or linear-oblong, 12–13 × 30–42 μ, slightly or not constricted at septum, obtuse or truncate at both ends, coronate with short tubercles above, wall golden-brown, smooth, thin, 1 μ, somewhat thicker above, 2–4 μ exclusive of tubercles, and darker-colored; pedicel broad, very short, concolorous.

On *Agrostis Thurberiana* Hitchc., Glacier, British Columbia, 1200 meters, September 5, 1902 (type); July 29, 1907, *E. W. D. Holway*. This species differs in its smaller and more delicate uredinio- and teliospores from *Puccinia Rhamni* (Pers.) Wettst. (*P. coronata* Corda), to which it bears considerable resemblance, and from other species on *Agrostis* by the coronate teliospores. Collections were made at three or four localities, in the same general region. In each case the rust grew in connection with aecia on *Limnorchis stricta* (Lindl.) Rydb. (*Habenaria gracilis* S. Wats.), and the collector believes the two forms are genetically related. The first collection is accompanied by this note: "This grew adjoining the *Habenaria* aecidium, and nowhere else. There were two localities, one a high meadow where it was quite abundant, and another where only a half dozen plants of the *Habenaria* grew, and between these plants the rust was found, the orchid leaves still showing the old aecidia."

Puccinia Chaetochloae nom. nov.

The uredinial stage of the species was described in the previous paper of this series. Since then the telia have been detected by Dr. Bessey in a specimen gathered at Miami, Florida, January 16, 1907, which makes it possible to transfer the rust to the genus *Puccinia*. It may be described as follows:

II. *Uredo Chaetochloae* Arth. Bull. Torrey Club **33**: 518. 1906.

III. Telia amphigenous, few, scattered, oblong or linear, small,

0.1 mm. wide by 0.5–1 mm. long, tardily naked by a longitudinal slit; teliospores ellipsoid, often irregular, 23–26 × 32–37 μ, rounded at both ends, slightly or not constricted at septum, wall chestnut-brown, concolorous, thin, 1–1.5 μ, rarely thickened slightly at apex, smooth; pedicel colored, short, often obliquely attached.

On *Chaetochloa macrosperma* Scribn. & Merr., Miami, Florida. Telia collected January 16, 1907, *Ernst A. Bessey 59*.

Puccinia panicicola sp. nov.

O and I. Pycnia and aecia unknown.

II. Uredinia amphigenous, numerous, scattered, oval, 0.1–0.3 mm. wide by 0.2–0.4 mm. long, soon naked, pulverulent, dark cinnamon-brown, ruptured epidermis noticeable; urediniospores broadly ellipsoid or obovoid, 23–25 by 26–30 μ, wall dark cinnamon-brown, rather thick, 1.5 μ, closely and strongly echinulate-verrucose with blunt points, pores 3–4, sometimes only 2, equatorial.

III. Telia not seen.

On *Panicum molle* Sw., Santiago de las Vegas, Cuba, March 1, 1907 (type), March 6, 1903, *C. F. Baker;* Cuautla, State of Morelos, Mexico, October 12, 1898, *E. W. D. Holway 3045; Panicum hebotes* Trin., Jalapa, State of Veracruz, Mexico, October 5, 1898, *E. W. D. Holway 3083*. No teliospores have been seen by the writer, but a few were seen by the collector, according to a note in the packet of the last-named collection. The species is much like *P. eslavensis* D. & H., but the urediniospores are smaller, more strongly sculptured, and have thinner walls with fewer pores.

Puccinia quadriporula sp. nov.

O and I. Pycnia and aecia unknown.

II. Uredinia hypophyllous, scattered, roundish or oblong, 0.4–1 mm. long, early naked, somewhat pulverulent, cinnamon-brown, ruptured epidermis inconspicuous; urediniospores broadly ellipsoid or globoid, 17–21 × 22–26 μ, wall cinnamon-brown, medium thin, 1.5–2 μ, finely and evenly echinulate, pores 4, equatorial.

III. Telia hypophyllous, scattered, roundish or oblong, 0.4–1 mm. long, soon naked, somewhat pulvinate, blackish-brown, ruptured epidermis noticeable; teliospores clavate-oblong, 16–21 × 42–48 μ, usually rounded above, rounded or often narrowed below, wall chestnut-brown, concolorous, rather thin, 1–1.5 μ, thicker at apex, 9–10 μ, smooth; pedicel slightly tinted, about one-half length of spore.

On *Carex vulgaris* Fries (*C. Goodenovii* J. Gay), Isle au Haut, Maine, September 25, 1899, *J. C. Arthur* (type); *C. spectabilis* Dewey, Glacier, British Columbia, August, 1907, *E. W. D. Holway*. Only one species of *Puccinia* on *Carex* possessing four equatorial pores in the urediniospores has heretofore been recognized from North America. That species, *Puccinia minuta* Diet., on *C. verrucosa* from Alabama, is easily distinguished by its much larger and more nearly globose urediniospores, and other less evident characters. The two widely separated stations indicate that it is not uncommon in the northern regions, although little material is yet available for study.

Puccinia minutissima sp. nov.

O and I. Pycnia and aecia unknown.

II. Uredinia hypophyllous, scattered, round or nearly so, 0.2–0.3 mm. across, early naked, chestnut-brown, pulverulent, ruptured epidermis conspicuous; urediniospores globoid or broadly ellipsoid, very small, 13–16 × 16–20 μ, wall chestnut-brown, medium thick, 1–1.5 μ, finely echinulate, pores 2, in upper part, evident.

III. Telia hypophyllous, numerous, scattered, round or oblong, 0.2–0.3 mm. wide by 0.2–0.7 mm. long, early naked, pulvinate, blackish-brown, ruptured epidermis conspicuous; teliospores oblong-clavate, 15–22 × 42–64 μ, slightly constricted at septum, apex rounded or obtuse, narrowed below, wall dark chestnut-brown, concolorous, smooth, 1–1.5 μ at sides, much thickened above, 9–13 μ; pedicel one fourth length of spore or less, firm, tinted.

On *Carex filiformis* L., in sphagnum swamp, Lansing, Michigan, September 5, 1885, *J. C. Arthur* (type); in a sphagnum bog, London, Ontario, Canada, October, 1898, *J. Dearness* (Ellis & Ev. Fungi Columb. *1382*); Kewanna, Indiana, October, 1893, *L. M. Underwood* (part of some specimens in Ellis & Ev. Fungi Columb. *258*). The species is especially characterized by the unusually small urediniospores, but is also well marked in other respects.

Prospodium bahamense sp. nov.

O. Pycnia unknown.

II. Urediniospores intermixed with the teliospores, few seen, broadly ellipsoid or globoid, 18–23 × 24–27 μ, walls golden-brown,

not noticeably laminate, medium thick, 2.5–3 μ, sparsely and strongly verrucose, pores 2, opposite and equatorial.

III. Telia hypophyllous, minute, scattered, or crowded into seemingly pulvinate groups of 0.2–1 mm. across, early naked, blackish, ruptured epidermis not noticeable; paraphyses numerous, peripheral, united at the bases, terete, 9–10 × 55–64 μ, acuminate, somewhat incurved, wall firm, about 2 μ thick, dark chestnut-brown, smooth; teliospores few in a sorus, broadly ellipsoid, 24–27 × 32–39 μ, rounded at both ends, slightly constricted at the septum, wall chocolate-brown, rather thick, 3.5–4.5 μ, gelatinous layer golden-yellow, not conspicuous except at apex and sometimes at base where it produces an umbo-like thickening of 2–3 μ, closely and rather coarsely verrucose; pedicel pale amber-colored throughout, once to once and a half length of spore, with one whorl of rather large, much branched appendages, near the base.

On *Tecoma bahamensis* Northrop, New Providence, Bahamas, March 12–24, 1907, *Elizabeth G. Britton 6596*. A very distinct species, intermediate in the character of its appendages between *P. appendiculatum* and *P. Amphilophii*. The paraphyses are particularly noteworthy. Being large and stout, and very dark-colored, they are especially conspicuous. But they are unique in the way in which they adhere at the bases to form a circle about the spores. The sorus may be readily separated as a whole from the tissue of the host, with the spores in place. It then appears campanulate, like a partially opened flower, borne on a slender, pale pedicel, which is formed of the greatly compressed portions of the paraphyses and spore-stalks where they pass through the epidermis.

Calliospora Petalostemonis sp. nov.

O. Pycnia chiefly hypophyllous, preceding or accompanying the telia, numerous, scattered, conspicuous, golden-yellow becoming brown, subcuticular, conical, 80–110 μ wide, about half as high; ostiolar filaments 30–50 μ long.

III. Telia hypophyllous, scattered, small, roundish, 0.3–0.6 mm. across, chocolate-brown, somewhat pulverulent, ruptured epidermis somewhat noticeable; teliospores ellipsoid, 23–29 × 35–45 μ, rounded at both ends, slightly or not constricted at septum, wall laminate, inner layer light chestnut-brown, medium thick, 2–2.5 μ, pores two in each cell, lateral and opposite, outer layer gelatinous, pale-yellow, rather thin, 1–1.5 μ, very finely and rather sparsely verrucose; pedicel colorous, about 6 μ in diameter, short and largely deciduous, not swelling in water.

On *Petalostemon oligophyllus* (Torr.) Rydb., Pecos, New Mexico, 1903, *T. D. A. Cockerell.* Both the pycnia and telia of this species are most abundant and conspicuous. It differs from *Uropyxis Petalostemonis* (Farl.) DeToni in the absence of uredinia and paraphyses, and in other less evident characters.

Aecidium Petalostemonis Kellerman & Carleton, sp. nov.

O. Pycnia amphigenous, sparsely disposed in indefinite groups, inconspicuous, subepidermal, globoid, 70–100 μ in diameter by 90–100 μ high; ostiolar filaments 30–45 μ long.

I. Aecia amphigenous, gregarious, irregularly arranged in indefinite groups, on discolored spots occupying all or part of a leaf, short, about 0.2 mm. across; peridium colorless, margin somewhat lacerate, spreading or somewhat recurved, peridial cells rhomboidal, overlapping, outer wall rather thick, 5–7 μ, not conspicuously striate, smooth, inner wall medium thin, 3–4 μ, rather finely verrucose; aeciospores broadly ellipsoid or globoid, 18–24 × 20–28 μ, wall colorless, rather thin, 1–1.5 μ, evenly and rather finely verrucose.

On *Petalostemon candidus* (Willd.) Michx., Manhattan, Kansas, June, 1886, *W. A. Kellerman* (Ellis & Ev. N. Am. Fungi *1845*), Lincoln, Nebraska, May 27, 1902, *John L. Sheldon; P. purpureus* (Vent.) Rydb. (*P. violaceus* Michx.), Manhattan, Kansas, June 6, 1887, *Kellerman & Swingle*, Stockton, Kansas, June 6, 1906, *E. Bartholomew* (Bartholomew, Fungi Colum. *2296*); *P. villosus* Nutt., Merriman, Nebraska, July 11, 1899, *J. M. Bates.* It is also recorded on *P. multiflorus* Nutt. from Kansas (Trans. Kansas Acad. Sci. **10**: 91. 1887), and on an undetermined species of *Petalostemon*, above Big Horn, Wyoming (Proc. Davenport Acad. Sci. **7**: 252. 1889). This name was used by Kellerman and Carleton over twenty years ago in a "Second list of Kansas parasitic fungi, together with their host plants," contributed to the tenth volume of the Proceedings of the Kansas Academy of Science, but without a description. The name was written "*Aecidium Petalostemonis* Farl.," and during the year following the type collection was issued in Ellis & Ev. N. Am. Fungi as "*Puccinia Petalostemonis* Farl." Since that time it has been variously ascribed to Farlow and to Kellerman & Carleton, or as "I" of *Puccinia Petalostemonis* or *Uropyxis Petalostemonis.* Under the last name Sydow in his Monog. Uredinearum appends a partial description, but without using a distinctive name or positively referring it to *Uropyxis.*

The form can not belong to the life cycle of *Uropyxis Petalostemonis* for numerous reasons. No aecial stage has yet been discovered for any species of that genus. Should one ever be found, it will doubtless have subcuticular pycnia and aecial paraphyses, having no true peridium, as occurs in *Phragmopyxis*, which is simply *Uropyxis* with three-celled teliospores. Beside, *U. Petalostemonis* is known to have a primary uredo accompanied by pycnia, which excludes the likelihood of an aecial stage. Finally both from structure and analogy the form may be considered as part of some heteroecious grass rust.

Aecidium fluxum sp. nov.

O. Pycnia chiefly epiphyllous, few, inconspicuous, subepidermal, honey-yellow, subglobose, small, 75–90 μ in diameter by 66–80 μ high; ostiolar filaments long, 80–112 μ.

I. Aecia chiefly hypophyllous, few, widely separated in indefinite groups, short, small, 0.1–0.2 mm. in diameter; peridium colorless, irregularly lacerate, recurved, peridial cells rhomboidal in longitudinal section, 27–35 μ long, overlapping, outer wall rather thick, 5–7 μ, transversely striate, smooth, inner wall about half as thick, somewhat striate, finely verrucose; aeciospores globoid, 20–25 μ in diameter, wall pale-yellow, thin, about 1 μ, irregularly and rather prominently verrucose.

On *Amorpha canescens* Pursh, Colorado, 1907, *H. L. Shantz*, communicated by E. W. D. Holway. A delicate and inconspicuous species. It may be remarked that *Aecidium Amorphae* Cooke (Grevillea **6**: 137. 1878) is the primary uredo of *Uropyxis Amorphae* (Curt.) Schröt., while the present form is part of a heteroecious species, doubtless one of the grass or sedge rusts.

Aecidium Boehmeriae sp. nov.

O. Pycnia epiphyllous, few in small groups about 1 mm. across, honey-yellow becoming brownish, punctiform, not conspicuous, globose or depressed-globose, small, 70–90 μ in diameter by 50–75 μ high; ostiolar filaments up to 65 μ long.

I. Aecia hypophyllous, gregarious or sometimes in annular groups 2–10 mm. across, on larger discolored spots, short, small, about 0.1 mm. in diameter, rather pale-yellow; peridium colorless, margin erose, recurved, peridial cells rhombic, small, 16–23 μ long, inner wall medium thin, 3–4 μ, moderately verrucose, outer wall medium thick, 5–6 μ, striate, smooth; aeciospores globoid,

often angular, very small, 10–13 μ in diameter, wall pale-yellow, very thin, 0.5–1 μ, very finely verrucose, appearing smooth.

On *Boehmeria cylindrica* (L.) Willd., Takoma Park, District of Columbia, June 6, 1898, collector uncertain, fungi of the T. A. Williams collection, distributed by the U. S. National Museum. This species is morphologically similar to the common *Aecidium Urticae*, belonging to *Puccinia Caricis*, but scarcely half the size throughout, and with other distinctions. The fungus has been collected in other localities along the Atlantic coast and in Indiana, but no specimens are in the writer's herbarium.

Caeoma occidentale sp. nov.

O. Pycnia amphigenous, scattered, minute, inconspicuous, subcuticular, honey-yellow, hemispherical, 65–100 μ in diameter by 23–32 μ high.

I. Aecia from a limited mycelium, hypophyllous, sparsely arranged in two rows on yellow spots occupying part or all of a leaf, roundish to oblong, 0.3–1 mm. or more long by 0.3–0.4 mm. wide, soon naked, orange-yellow; peridium wanting; aeciospores catenulate, broadly ellipsoid, 20–24 × 27–32 μ, wall colorless, medium thin, 1.5–2.5 μ, moderately and rather closely verrucose.

On *Pseudotsuga mucronata* (Raf.) Sudw. (*Pseudotsuga Douglasii* Carr., *Abies Douglasii* Lindl.), Beaver River Valley, British Columbia, alt. 860 meters, July 27, 1907, *E. W. D. Holway*. This rust is interesting as the second foliicolous caeoma on *Pinaceae* in North America. The other occurs on *Tsuga canadensis* in the North Atlantic region. The eastern and western species differ greatly in size of spores, and other characters.

Uredo Grayiae sp. nov.

II. Uredinia amphigenous, scattered, sometimes confluent, roundish, 0.5–1 mm. across, soon naked, pulverulent, chocolate-brown, ruptured epidermis somewhat noticeable; urediniospores ellipsoid or obovate-ellipsoid, 19–23 × 32–42 μ, wall dark chestnut-brown, somewhat lighter below, rather thick, 2–2.5 μ, slightly thicker above, 2.5–3.5 μ, moderately verrucose above, smooth along the sides, pores 8 in two transverse zones equidistant from the equator.

On *Grayia spinosa* (Hook.) Moq. (*G. polygaloides* H. & A.), Fallon, Nevada, August 21, 1907, *L. L. Harter 1506*, communicated by C. L. Shear. The species is remarkable in the close

resemblance of the spores to those of some species of *Ravenelia*. The upward thickening of the walls, the distribution of color, pores and sculpturing, are characters when taken together that would indicate a member of the subfamily of *Raveneliatae*, but the family of the host is widely removed from any represented in that group of rusts. Its relationship is, consequently, problematical.

Uredo inquirenda sp. nov.

II. Uredinia amphigenous, scattered or in circinating groups, round, 0.5 mm. across, subepidermal, soon naked, dark cinnamon-brown, pulverulent, ruptured epidermis noticeable; urediniospores oval or obovate, 18–23 × 28–36 μ, wall cinnamon-brown, rather thin, 1–1.5 μ, somewhat thicker above, 1.5–2.5 μ, evenly and strongly echinulate, pores 8, unevenly spaced in two zones of 4 each, equidistant from the equator; pedicels more or less persistent, slender, usually once or more length of spore; paraphyses none.

On undetermined plant, bearing the local name of "Washington Vine," Auburn, Alabama, December 12, 1889, *Geo. F. Atkinson 1051*. This species, like the preceding one, possesses the characters of the *Raveneliatae*, and for this reason has special interest. The rust appears to have been very abundant, all of the leaves of the collection being well covered with sori. The material came into my hands about three years ago among a lot of undetermined specimens, kindly sent from the herbarium of Cornell University for study. Since that time much effort has been expended to ascertain the probable identity of the host, but without making the slightest advance. Dr. E. M. Wilcox and Prof. J. F. Duggar of Auburn, Ala., have made inquiries and can find no trace of the original plant, or of any plant to which the name of "Washington Vine" is now applied. The collector is unable to recall any helpful information, and other botanists familiar with the southern flora do not recognize it. There are only individual leaves in the collection. These are 4–6 cm. long by 1–2 cm. wide, rather thin, green both sides, smooth, entire, lanceolate, sessile, or narrowed into short petioles. It is probable that the plant is not a native of the southern states, but has been cultivated for ornament.

PURDUE UNIVERSITY,
LAFAYETTE, INDIANA

Notes on a parasitic Gnomonia*

CLAUDE WILBUR EDGERTON

In the month of July, 1906, while looking for the presence of anthracnose on the canes of the blackberry, *Rubus nigrobaccus*, in the vicinity of Ithaca, New York, I found in the garden of Professor Whetsel a few canes that were affected with a pyrenomycete, a member of the genus *Gnomonia*. Thinking that this might be the perfect stage of the anthracnose, I gathered material and made a study of it. The result of the study showed that the fungus had no connection with the *Gloeosporium*, yet from the fact that it seems to be undescribed in this country and may occasionally cause disease of the blackberry canes, it seems well to make a note of it with drawings and photographs.

The disease evidently made its appearance in the spring, as spots were noticed on the canes at pruning time. But no effect on the canes had been noticed at that time. Leaves developed normally, blossoms appeared on the stems, and the fruit set, so that the plants had the appearance of being perfectly healthy. It was not until the fruit was a little over half grown that the effect of the disease was noticed. Very suddenly, the leaves and the fruit above the spots wilted and dried up. The effect on the plant seemed to be that of girdling. The appearance of the canes was very similar to the cane blight of raspberries caused by a species of *Coniothyrium*, as described by Stewart and Eustace.† The plants were in this condition when they were first observed by the writer. The spots at this time were very evident, being two to five inches in length and completely encircling the stems, somewhat lighter in color than the healthy regions and possessing a dry, dead appearance.

An examination of the spots showed the presence of numerous black perithecial beaks, which appeared to the naked eye as small black setae, protruding through the dead cortex (FIG. 1). The main body of the perithecium was imbedded in the host tissue.

* Contribution from the Department of Botany, Cornell University, No. 123.

† New York Experiment Station Bulletin no. 226, Geneva, N. Y.

The microscopic characters of the fungus as I have determined them are as follows: The perithecia (FIG. 2) are subglobose, 200–260 × 175–220 μ, filled with the numerous asci. The asci (FIGS. 3*a*, *b*) are long-clavate, 30–50 × 6–9 μ, and contain as a rule but four spores, though occasionally some aborted spores may be seen at

FIG. 1. *Gnomonia Rubi* Rehm on stem of *Rubus nigrobaccus*. Shows the beaks of the perithecia protruding through the cortex.

the base. The pore through which the spores escape, although not as prominent as in some other members of the genus *Gnomonia*, is surrounded by the thickened cellulose ring which appears as a refractive dot on each side of the opening. The spores (FIG. 3*c*) are in one or two series, filling nearly the whole ascus, about

14–19 × 3–5 μ. They are two-celled, the two cells being equal, constricted at the septum, somewhat fusoid, quite often guttulate. Each end of the spore is continued into a long hyaline point, but this falls away very readily so that the end of the spore has a rounded appearance (FIG. 3*d*). Paraphyses are absent.

Cultures of the ascospores were made in bean agar. The spores germinated readily by sending out a germ-tube at each end (FIG. 3*e*). No germ-tube was seen coming from the side of the spore. A much-branched and septate mycelium resulted

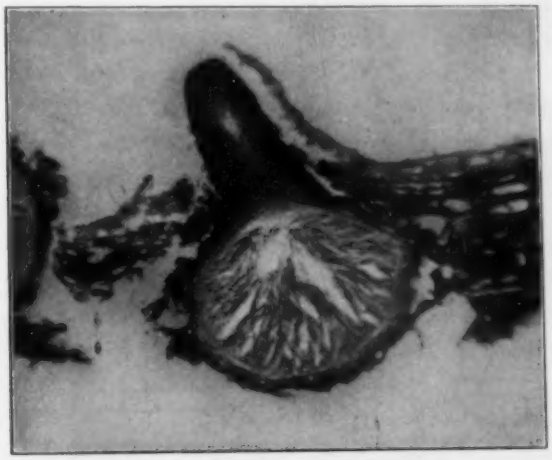


FIG. 2. Photomicrograph of a section of a perithecium of *Gnomonia Rubi*.

which spread rapidly over the agar, forming a very thin submerged growth. Pieces of the agar were transferred to sterilized bean pods and blackberry stems. On both substrata, growth continued rapidly. In about ten to fourteen days, perithecia with the same appearance and structure as those originally found on the blackberry began to form. The only observable difference was in the beak of the perithecium. This was much longer on the perithecia formed in pure culture, and quite often it was bent back in the form of a hook near the apex. This same variation in the length of the beak in pure culture has been noticed by Klebahn * in another member of the genus, *Gnomonia veneta*

* KLEBAHN, H. Ueber einige *Fungi imperfecti* und die zugehörigen Ascomycetenformen. Jahrb. für wissensch. Botanik **41**: 519. *f.* 4. 1905.

(Sacc. & Speg.) Kleb. In no culture in the laboratory nor on the material collected on the blackberry was I able to find a trace of a conidial stage.

This fungus was first named by Rehm, *Gnomonia tetraspora* Wint. var. *Rubi* Rehm, but in volume IX of the *Sylloge Fungorum*, Saccardo considers it a good species and uses the name *Gnomonia Rubi* Rehm. The latter name seems to be preferable and will be used here. Some of the material was sent to Rehm and the identification was confirmed by him.

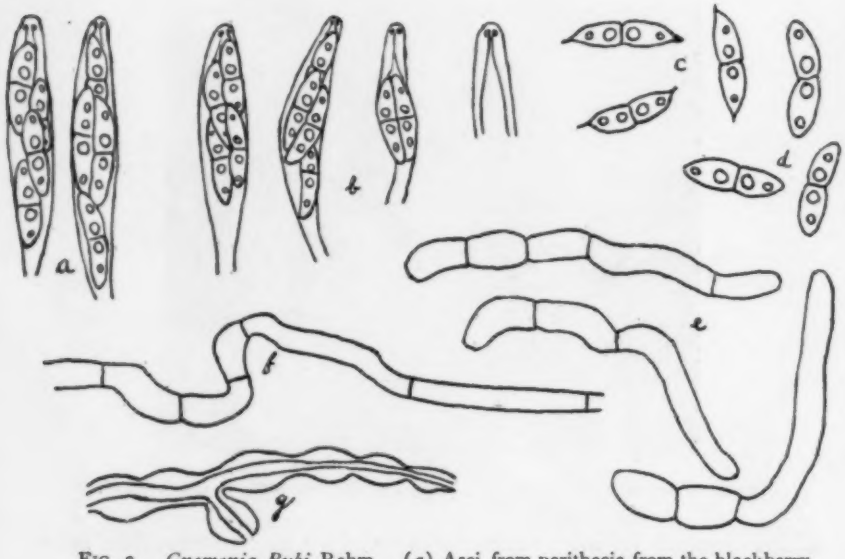


FIG. 3. *Gnomonia Rubi* Rehm. (*a*) Asci from perithecia from the blackberry. (*b*) Asci from perithecia in pure culture. (*c*) Ascospores. (*d*) Ascospores as they appear after losing their appendages. (*e*) Ascospores germinating. (*f*) The same older stage. (*g*) Irregularly thickened mycelial thread, a common condition in old cultures.

To prove the connection of the fungus with the disease on the canes, inoculation experiments were attempted in 1907. Early in the spring, in the greenhouse, some young plants were inoculated with a pure culture of the fungus. The plants were very young, the canes being perfectly green. This inoculation was a failure; the fungus did not seem to be able to attack the young actively growing canes.

Later in the season, on May 9, about ten or twelve blackberry

plants growing wild near Ithaca were inoculated, the inoculations being made at various places on the canes. As a result of these inoculations, two plants became infected with the disease. Why the other eight or ten inoculations did not take may possibly have been due to a loss of virulence, caused by growing the fungus for ten months on artificial media. However the wild blackberry plants may be more resistant to the attacks of these forms than the cultivated varieties and this may have had something to do with the poor infection. One of the successful inoculations was on a wound made by cutting off the entire upper third of the plant. The disease followed down the stem and in a few weeks perithecia were produced in abundance. In the other successful inoculation, the pure culture of the fungus was inserted in a wound made by removing one of the small side branches. The disease spread in all directions, finally encircling the stem. The plant was not killed as suddenly as the original plants that were found, but died more gradually. Fruit set on the branches, but most of it dried up before it matured. Perithecia were produced on the diseased portion about three or four months after the inoculation. However, these were not produced in such great abundance as they were on the original plants.

The results of this study seem to show that the fungus *Gnomonia Rubi* Rehm is a weak facultative parasite, a form that will grow rapidly as a saprophyte on the dead canes and will if conditions are suitable adapt itself to the living cane. It does not seem probable that it is a form that is liable to become a serious pest to blackberry canes, but rather one that may appear as a parasite only occasionally, only when the conditions are right.

A synopsis of the New England species of Tetmemorus

Joseph Augustine Cushman

With the present records all four species of *Tetmemorus* found in the British Isles are known from New England. The species of *Tetmemorus* are not striking in their appearance and one studying plankton rarely meets with them. In New England the species appear to be mostly found in sphagnum pools and also as a rule seem to be more common at an elevation, being found very abundantly in certain mountain ponds with sphagnous borders.

The figures given by Wolle were poor and in some cases were referred to the wrong species. The corrected synonymy for the various species is given. The measurements are from New England specimens only. Records for which specimens have been seen are followed by an exclamation point. While based upon New England material this should cover the whole northeastern United States.

TETMEMORUS Ralfs, 1844

Cells usually fusiform-cylindrical, straight, with a slight median constriction, and a narrow incision at the center of the apices: cell circular or elliptical in end view: cell-wall usually punctate or slightly scrobiculate: each semicell with a single chloroplast, with a central row of pyrenoids.

1. Tetmemorus Brébissonii (Menegh.) Ralfs

Closterium Brébissonii Menegh. Linnaea **14**: 236. 1840.

Tetmemorus Brébissonii Ralfs, Ann. Mag. Nat. Hist. **14**: 257. *pl. 8. f. 1.* 1844. — Brit. Desm. 145. *pl. 24. f. 1, a, b, c.* 1848. — Wolle, Desm. U. S. 91. *pl. 20. f. 1, 2. pl. 50. f. 36.* 1884.

Cells subcylindrical, attenuate toward the apices, much more so in side view, about 6 times as long as wide; apices broadly rounded in both front and side views; cell-wall minutely punctate in longitudinal lines; chloroplasts with 4–5 pyrenoids.

Length 189–236 μ: breadth 34–37 μ: isthmus 20–31 μ.

Maine: Orono (*W. West*). New Hampshire: North Woodstock! Massachusetts: Guilder Pond, Mt. Everett, Mount

Washington! Lake Quinsigamond, Worcester (*Stone*); Tewksbury (*Lagerheim*); Waverley (*Johnson*); Bridgewater! Lake Watuppa, Fall River! RHODE ISLAND: Wainskut Pond, North Providence (*Bailey*).

2. TETMEMORUS GRANULATUS (Bréb.) Ralfs

Closterium granulatum Bréb., in Cheval. Microscop. et Usage 272. 1839.

Tetmemorus granulatus Ralfs, Ann. Mag. Nat. Hist. **14**: 257. *pl. 8. f. 2.* 1844. — Brit. Desm. 147. *pl. 24. f. 2. pl. 33. f. 1.* 1848. — Wolle, Desm. U. S. 91. *pl. 50. f. 33, 34.* 1884.

Cells decidedly attenuate toward the apices in both front and side views, about 5½ times as long as wide; apices narrowly rounded; cell-wall scrobiculate in encircling lines at the base of the semicell, becoming irregular and more crowded toward the apex; chloroplasts with 4–5 pyrenoids.

Length 168–260 μ: breadth 34–46 μ: isthmus 22–38 μ.

MAINE: Orono (*W. West*). NEW HAMPSHIRE: Pudding Pond, North Conway! Intervale! Noone's Station! North Woodstock! MASSACHUSETTS: Guilder Pond on Mt. Everett, Mount Washington! Lake Quinsigamond, Worcester (*Stone*); Tewksbury (*Lagerheim*); Pondville! Lake Watuppa, Fall River! Wigwam and Almanac Ponds, Nantucket! RHODE ISLAND: Providence (*Bailey*).

3. TETMEMORUS LAEVIS (Kütz.) Ralfs

Closterium laeve Kütz. Phyc. Germ. 132. 1845.

Tetmemorus laevis Ralfs, Brit. Desm. 146. *pl. 24. f. 3.* 1848. — Wolle, Desm. U. S. 91. *pl. 20. f. 3. pl. 50. f. 35.* 1884.

Tetmemorus minutus Wolle, *pl. 20. f. 7–9.* 1884.

Cells subcylindrical, about 4 times as long as wide, gradually attenuate to the apices, which are broadly rounded; cell-wall minutely punctate; chloroplasts with 3–5 pyrenoids.

Length 70–127 μ: breadth 19–23 μ: isthmus 17–19 μ.

MAINE: Orono (*W. West*). MASSACHUSETTS: Lake Quinsigamond, Worcester (*Stone*); East Bridgewater! Lake Watuppa, Fall River! Sandwich! Chilmark! Nantucket!

4. TETMEMORUS MINUTUS DeBary.

Tetmemorus minutus DeBary, Conj. 41. *pl. 5. f. 10.* 1858.

Cells attenuate toward the apices in both front and side views,

more so in the latter, about 3 times as long as wide; apices broadly rounded; cell-wall slightly punctate; chloroplasts with 1 or 2 pyrenoids.

Length 65 μ: breadth 19 μ.

MASSACHUSETTS: Guilder Pond, on Mt. Everett, 600 meters, Mount Washington!

A key to the New England species of Tetmemorus

Cells large, usually 5 times as long as wide; cell-wall scrobiculate or punctate in a definite pattern, at least near the base of the semicells.

Scrobiculations or punctulations in definite longitudinal lines; cells very slightly attenuate from base to apex. 1. *T. Brébissonii.*

Scrobiculations in horizontal lines at the base of the semicell, elsewhere scattered, gradually attenuate from base to apex. 2. *T. granulatus.*

Cells smaller, less than 5 times as long as wide; cell-wall irregularly punctate.

Cells about 4 times as long as wide; chloroplast with 3–5 pyrenoids. 3. *T. laevis.*

Cells about 3 times as long as wide; chloroplasts with 1 or 2 pyrenoids. 4. *T. minutus.*

BOSTON SOCIETY OF NATURAL HISTORY.

Notes on Carex — III

Kenneth Kent Mackenzie

Carex latebrosa sp. nov.

Carex Gayana hyalina Bailey, Proc. Am. Acad. **22**: 135. 1886. Not *Carex hyalina* Boott.

Growing in dense clumps, somewhat stoloniferous, the culms 3–9 dm. high, roughened on the angles, especially above, much exceeding the leaves. Leaves with well-developed blades usually three to six to a culm, all on the lower third, the blades 8–35 cm. long, 1.5–4 mm. wide, flat or somewhat involute, roughened on the margins and towards the apex; spikes linear-elliptic, 1 cm. long or less, from about seven to thirty, aggregated into a linear or linear-oblong head, 2–4 cm. long, 4–8 mm. wide, simple or slightly compound, the lower spikes more or less separate; spikes largely and often entirely staminate, or usually bearing one to several perigynia at or near the base; bracts absent, or the lower occasionally present, shorter than the head, somewhat enlarged at base, acuminate or short-cuspidate; scales ovate-lanceolate, from short-cuspidate to obtusish, usually acutish, straw-colored (without a trace of green at maturity), hyaline, wider and longer than the perigynia which are completely concealed (except where the scales get broken), the whole head appearing as a mass of straw-colored scales, with occasional dark spots, showing the concealed perigynia; perigynia ascending, brownish at maturity, plano-convex, ovate (rather narrowly), 3.5 mm. long, 1.5 mm. wide, broadly rounded at base, tapering into the beak which is about one-half the length of the body, the body slightly spongy at base, nerved on the outer, nerveless but narrowly margined above on the inner surface, the beak serrulate, its apex in age somewhat bidentate; perigynia thin, readily separating from achenes at maturity; achenes lenticular, with suborbicular face, about 1.5 mm. long; stigmas two.

Although referred by Professor Bailey as a variety to the North American plant which has been passing as *Carex Gayana* E. Desv. (*Carex simulata* sp. nov. *infra*), it seems to me that this plant is more closely related to some of the forms of *Carex marcida* Boott. It does not possess the characteristic short-beaked perigynium of the former plant, and this has caused most specimens collected to be referred to the latter plant. However, it is readily

distinguished at sight from all forms of *Carex marcida*, and is clearly entitled to specific rank. The most easily noticed points of distinction may be contrasted as follows:

Perigynium very abruptly contracted into a very short beak, about one-fifth the length of the body. *C. simulata.*

Perigynium tapering into a beak, one-half the length of the body or more.

Spikes with one to several inconspicuous perigynia, the head appearing a mass of straw-colored scales; staminate flowers conspicuous; blades 1.5–4 mm. wide. *C. latebrosa.*

Spikes with about ten perigynia concealed by the scales, but conspicuous; scales tinged with green or brown; staminate flowers inconspicuous; blades 1.5 mm. wide. *C. marcida.*

The following specimens of *Carex latebrosa* (all in the Columbia College herbarium except the New Mexico specimens and the fine specimens collected by Palmer) have been seen:

MEXICO: Sonora, *Thurber 652*, 185-(type); Durango, *Palmer 96*, 1896 (N. Y. Bot. Gard.); San Bernardino, Sonora, *Thurber 337*, June, 1851; Camp Tezotal, Sonora, *Schott 4*, 1855.

NEVADA: Unionville Valley, *Watson 1227*, October, 1867; Spring Valley, *Watson 1227*, September, 1868.

NEW MEXICO: Cienega, *E. O. Wooton*, July 12, 1906; Mogollon Creek, Mogollon Mountains, Socorro County, *O. B. Metcalfe*, July 14, 1903. (Both in Herb. N. Mex. Agric. College.)

Carex simulata sp. nov.

"*Carex Gayana* Desv." Boott, Ill. Car. **3**: 126. *pl. 411.*

Culms 3–5 dm. high, from long running rootstocks, roughened on the angles, especially above, much exceeding the leaves. Leaves with well-developed blades two to five to a culm, all on its lower third, the blades erect-ascending, 8–30 cm. long, 2–4 mm. wide, flat, roughened on the margins and towards the apex; spikes 5–15, densely aggregated into a linear-oblong, oblong or ovate-oblong head, 12–25 mm. long, 6–10 mm. wide, the individual spikes not separate, but readily distinguishable, the more strongly pistillate ovate-oblong in outline, 7 mm. long, 3.5 mm. wide, with about ten perigynia at base and the inconspicuous staminate flowers above, while other spikes are almost entirely staminate with an occasional perigynium, whole heads being almost entirely staminate or little staminate, as the case may be; bracts absent, or the lower one or two, if present, shorter than the head, long-cuspidate, enlarged at base; scales brown with hyaline margin, strongly cuspidate, wider and noticeably longer than the

perigynia, which are completely concealed; perigynia ascending, brownish at maturity, plano-convex, broadly ovate, 1.8 mm. long, 1.4 mm. wide, broadly rounded at base, abruptly narrowed into a minute bidentate beak about 0.25 mm. long, hardly spongy at base, nerveless or nearly so, not margined, but the upper part of the body and the beak serrulate; achenes lenticular with broadly elliptic face, 1 mm. long; stigmas two.

The earliest description of *Carex Gayana* E. Desv. which I have seen (C. Gay, Fl. Chil. 6: 205) was published in 1854 according to the title-page of the work. However, the plates of this and some other species seem to have been issued in 1853 as *Cyperaceae chilenses* (*Historia de Chile*), and *plate 73, figure 3*, referred to in the description in Gray's work is here found. The specimens on which the species was based were collected in Chile, but Dr. Boott took up the name for a plant found in western North America, known to him from Fendler's *no. 881* and Bourgeau's from "Base of the Rocky Mountains." This last-named specimen is figured by him (*pl. 411*) as "*Carex Gayana* Desv.," and other authors who have had occasion to deal with the North American plant have followed him, although not without misgivings, the North American plant having been collected but little until recently. The real *Carex Gayana*, however, is a plant bearing much the same general resemblance to the North American plant, now named by me *Carex simulata*, that *Carex stenophylla* Wahl. does to *Carex marcida* Boott. The differences noted may be thus contrasted:

Culms 3.5 dm. high; heads 12–25 mm. long, linear-oblong to ovate-oblong; scales cuspidate; heads much exceeding the leaves. *C. simulata.*

Culms 1–2 dm. high; heads 8–18 mm. long, ovate; scales acuminate; heads little exceeding leaves. *C. Gayana.*

Of this species I have seen the following specimens:

WYOMING: Chug Creek, Albany County, *A. Nelson 7316*, June 29, 1900 (type, in Herb. N. Y. Bot. Garden); Headwaters of Clear Creek, *Tweedy 3336*, July–August, 1900; Point of Rocks, *Merrill & Wilcox 665*, June 19, 1901; Clear Creek, *T. A. Williams*, August 12, 1898.

COLORADO: North Park on edge of Wyoming, *Osterhout*, September 1, 1897; Rocky Mts. (Colorado?) *Vasey 595*.

MONTANA: Montana Valley, Madison County, *A. & E. Nelson 6483*, September 3, 1899.

WASHINGTON: Falson Valley, *Suksdorf*, May–July, 1884.
NEW MEXICO: *Fendler 881*, 1847.

Carex perglobosa sp. nov.

"*Carex incurva* Lightf.?" Bailey, in Coulter, Manual Rocky Mountain Region 390.

Culms erect, 12 cm. high, growing in small clumps, from running rootstocks, smooth on the angles, usually exceeding the leaves. Leaves clustered towards the base of the culms, the blades erect or somewhat spreading, 2–8 cm. long, 0.75–1.5 mm. wide, flattened at base, narrow but hardly involute above, slightly roughened towards the apex; head erect, very globular, about 1 cm. in diameter, the spikes entirely undistinguishable, the staminate flowers apical, very inconspicuous; perigynia numerous; bracts absent; scales ovate-orbicular, brownish with silvery hyaline margin, obtusish or acutish, rather wider than, but exceeded at maturity (usually strongly) by, the perigynia; perigynia brownish at maturity, ovate-elliptic, 4 mm. long, 2.25 mm. wide, somewhat inflated and slightly nerved on both faces, rounded at base, gradually tapering into the serrulate bidentate beak which is one third or less of the length of the marginless body; achenes lenticular with oblong-orbicular face, 1.75 mm. long, 1.25 mm. wide; stigmas two.

This species which occurs in the high mountains of Central Colorado has heretofore been referred to the circumboreal *Carex incurva* Lightf., a species which in America extends south in the Canadian Rocky Mountains as far as Banff, but which I have not seen from the United States. The species are, however, clearly distinct, and may be distinguished from one another as well as from *Carex vernacula* Bailey (*C. foetida* Am. authors) as follows:

Leaf-blades 2–3.5 mm. wide; perigynium little exceeding scale at maturity. *C. vernacula.*

Leaf-blades 1.5 mm. wide or less; perigynium much exceeding scale at maturity.

Head suborbicular to short-oblong, the spikes apparent; perigynium 3 mm. long, 1.5 mm. wide, stipitate, not inflated. *C. incurva.*

Head orbicular, the spikes not apparent; perigynium 4 mm. long, 2.25 mm. wide, not stipitate, somewhat inflated. *C. perglobosa.*

The following specimens have been examined, all from Colorado: Mt. Baldy, Summit County, *Mackenzie 167*, August, 1901 (type, in Herbarium K. K. Mackenzie); *Parry 385*, 1861; Gray's Peak and vicinity, *Patterson*, September 2, 1885; Silver Plume, *Rydberg*, August 21, 1895.

Carex agrostoides sp. nov.

Culms 4–8 dm. high, exceeding the leaves, roughened on the angles, the lowermost sheaths bladeless, conspicuous, the rootstalks short. Leaves with well-developed blades two to four to a culm, usually 2–3 dm. long, long-attenuate, 1–2 mm. wide, strongly involute, roughened towards the apex; head decompound, 4–7 cm. long, 8–20 mm. wide, the lower one or two branches more or less separated, the upper closely aggregated; spikes very numerous, closely sessile, distinguishable with difficulty, ovate-oblong, usually 2–5 mm. long, 1.5–2.5 mm. wide, containing one to several perigynia in the middle, the remainder staminate; bracts absent, or few and short (15 mm. long); scales ovate-oblong, obtusish to short-acuminate, brownish, with usually broad, whitish midrib, and conspicuous hyaline margins, wider than but slightly exceeded by the mature perigynia; perigynia lanceolate-cuneate, plano-convex in cross-section, 3 mm. long, 1 mm. wide, rounded-truncate at base, tapering at apex into a beak longer than the body, with serrulate margins and bidentate apex, the body nerveless on inner, nerved on outer, surface; achenes lenticular, 1 mm. long, 0.5 mm. wide; stigmas two.

This species has long been represented in the Columbia College herbarium by two rather fragmentary specimens, but it was not until I received from Prof. E. O. Wooton two fine sheets collected by himself that I felt justified in describing it. Probably most closely allied to *Carex latebrosa* (*supra*), it is readily distinguished not only by the decompound head, but also by the narrow, long-beaked perigynia. The name given to this plant by me owes its origin to the strong resemblance the head has to the dried up, congested panicles of some species of *Agrostis*.

The following specimens have been examined:

NEW MEXICO: Luna, northwest of Mogollon Mountains, Socorro County, altitude 6500 feet, *E. O. Wooton*, July 28, 1900 (type consisting of two sheets in Herb. New Mexico Agricultural College); Mangus Springs, *Rusby 425*, May, 1881 (Columbia College herbarium).

ARIZONA: San Francisco Mountains, *Rusby 426*, April, 1881 (Columbia College herbarium).

INDEX TO AMERICAN BOTANICAL LITERATURE
(1907)

The aim of this Index is to include all current botanical literature written by Americans, published in America, or based upon American material; the word America being used in its broadest sense.

Reviews, and papers which relate exclusively to forestry, agriculture, horticulture, manufactured products of vegetable origin, or laboratory methods are not included, and no attempt is made to index the literature of bacteriology. An occasional exception is made in favor of some paper appearing in an American periodical which is devoted wholly to botany. Reprints are not mentioned unless they differ from the original in some important particular. If users of the Index will call the attention of the editor to errors or omissions their kindness will be appreciated.

This Index is reprinted monthly on cards, and furnished in this form to subscribers, at the rate of one cent for each card. Selections of cards are not permitted; each subscriber must take all cards published during the term of his subscription. Correspondence relating to the card-issue should be addressed to the Treasurer of the Torrey Botanical Club.

Abrams, L. R. A new maple from Southern California. Torreya **7**: 217–219. *f. 1.* 19 N 1907.
Acer bernardinum sp. nov.

Allen, J. A. Mutations and the geographic distribution of nearly related species in plants and animals. Am. Nat. **41**: 653–655. 2 N 1907.

Ascherson, P. & Graebner, P. *Potamogetonaceae.* Das Pflanzenreich· 4^{11}: 1–184. *f. 1–36.* 29 O 1907.

Bailey, W. W. Some African flowers. Am. Bot. **13**: 30–33. O 1907.

Bartlett, H. H. Ueber das Vorkommen von *Juncus Dudleyi* Wiegand n Deutschland. Allgem. Bot. Zeits. **13**: 147, 148. S 1907.

Bennett, A. Notes on *Potamogetonaceae.* Jour. Bot. **45**: 373–377. 1 O 1907.

Black, J. M. Habitat of *Odontoglossum crispum.* Orch. Rev. **15**: 326–328. N 1907.

Blankinship, J. W. Plantae Lindheimerianae. Part III. Ann. Rep. Missouri Bot. Gard. **1907**: 123–223. 1907. [Illust.]

Boulenger, G. A. On the variations of the evening primrose (*Oenothera biennis* L.). Jour. Bot. **45**: 353–363. 1 O 1907.

Britton, E. G. Notes on nomenclature VIII. Bryologist **10**: 100, 101. 2 N 1907.

Burrell, W. H. *Leucobryum glaucum* Schp. Bryologist **10**: 107–111. *pl. 12.* 2 N 1907.

Caldwell, O. W. The teaching of botany in the high school. School Rev. **15**: 661–670. 1907.

Campbell, D. H. Studies on some Javanese *Anthocerotaceae*—I. Ann. Bot. **21**: 467–486. *pl. 44–46.* O 1907.

Cannon, W. A. An electric thermoregulator for paraffine baths and incubators. Plant World **10**: 262–264. *f. 53.* N 1907.

Chandler, H. P. Notes on two California Nemophilas. Bot. Gaz. **44**: 381, 382. 16 N 1907.

Clute, W. N. Our prairie sunflowers. Am. Bot. **13**: 25–27. O 1907. [Illust.]

Collins, F. S. Some new green algae. Rhodora **9**: 197–202. *pl. 76.* 26 O 1907.

Includes new species in *Pleurococcus*, *Chaetomorpha*, *Cladophora*, and *Vaucheria* (2), natives of the United States.

Copeland, E. B. Key to the families of vascular plants in the Philippine Islands. Philipp. Bur. Educ. Bull. **24**: 21–34. 1907.

Copeland, E. B. Outline of a year's course in botany. Philipp. Bur. Educ. Bull. **24**: 5–19. 1907.

Crocker, W. Germination of seeds of water plants. Bot. Gaz. **44**: 375–380. 16 N 1907.

Dahlstedt, H. Ueber einige südamerikanische *Taraxaca*. Ark. Bot. **6**[11]: 1–19. *f. 1–8.* 2 F 1907.

Includes *Taraxacum andinum* and *T. rhusiocarpum* spp. nov., natives respectively of Argentina and Patagonia.

Daufun, M. H. A teratological flower of *Campanula rotundifolia*. Plant World **10**: 265, 266. N 1907.

Dean, B. Notes on Asiatic museums. Pop. Sci. Mo. **71**: 481–497. *f. 1–16.* D 1907.

Demetrio, C. H. A list of the mosses collected in different parts of Missouri. Bryologist **10**: 103–106. 2 N 1907.

Dismier, G. Sur la valeur spécifique des épaississements intralamellaires des dents péristomiales dans les espèces du genre *Philonotis*. Rev. Bryol. **34**: 112–114. N 1907.

Dobbin, F. Concerning willows. Am. Bot. **13**: 33–36. O 1907.

Drummond, J. R. The literature of *Furcraea* with a synopsis of the known species. Ann. Rep. Missouri Bot. Gard. **1907**: 25–75. *pl. 1–4.* 1907.

Dunham, E. M. Mrs. Mary L. Stevens. Bryologist **10**: 106. 2 N 1907.

Eaton, L. O. Notes on plants of Chesterville, Maine. Rhodora **9**: 207, 208. 26 O 1907.

Fernald, M. L. *Salicornia europaea* and its representatives in eastern America. Rhodora **9**: 204–207. 26 O 1907.

Fink, B. Further notes on Cladonias — XIII. *Cladonia cristatella* and *Cladonia coccifera*. Bryologist **10**: 97–100. *pl. 11*. 2 N 1907.

Gager, C. S. The self-pruning of trees. Jour. N. Y. Bot. Gard. 8: 252–254. N 1907.

Gager, C. S. The tardy defoliation of the trees. Jour. N. Y. Bot. Gard. 8: 254. N 1907.

Garrett, A. O. Effect of fire on an apple tree. Plant World **10**: 264. N 1907.

Gürke, M. *Cactaceae* Florae Uruguayae auctore J. Arechavaleta. Monats. Kakteenk. **17**: 161–166. 15 N 1907.

Gürke, M. *Cereus anguinus* Gürke n. sp. Monats. Kakteenk. **17**: 166–171. 15 N 1907.

Native of Paraguay.

Gürke, M. *Echinocereus polyacanthus* Engelm. Monats. Kakteenk. **17**: 170, 171. 15 N 1907. [Illust.]

Native of the southwestern United States and Mexico.

Hamet, R. Monographie du genre *Kalanchoe*. Bull. Herb. Boiss. II. **7**: 869–900. 31 O 1907.

Harshberger, J. W. An unusual method of vegetative reproduction in *Dionaea muscipula*. Bot. Gaz. **44**: 382, 383. *f. 1*. 16 N 1907.

Harvey, J. C. Orchid collecting in Mexico. Orch. Rev. **15**: 350, 351. N 1907.

Harvey, L. H. Branching sporangiophores of *Rhizopus*. Bot. Gaz. **44**: 382. *f. 1*. 16 N 1907.

Hassler, E. Plantae paraguarienses novae vel minus cognitae — VI. Bull. Herb. Boiss. II. **7**: 917–931. 31 O 1907.

Includes descriptions of new species in *Peperomia* (3), *Polygala* (2), *Dryopteris* (2), *Polypodium*, *Elaphoglossum* (3), *Cyathea*, *Danaea*, *Odontonema*, *Justicia*, and *Solanum*.

Hebden, T. Some British Columbia lichens. Bryologist **10**: 101, 102. 2 N 1907.

Hemsley, W. B. *Shortia uniflora*. Curt. Bot. Mag. IV. **3**: *pl. 8166*. N 1907.

Native of Japan. Notes appended on several American *Diapensiaceae*.

Holm, T. *Anemonella thalictroides* (L.) Spach; an anatomical study. Am. Jour. Sci. IV. **24**: 243–248. *f. 1–5.* S 1907.

Holm, T. Studies in the *Cyperaceae* — XXV. Notes on *Carex*. Am. Jour. Sci. IV. **23**: 422–432. *f. 1–13.* Je 1907.

Howe, M. A. Phycological studies — III. Further notes on *Halimeda* and *Avrainvillea*. Bull. Torrey Club **34**: 491–516. *pl. 25–30.* 17 D 1907.

Includes *H. simulans* sp. nov., native of the West Indies.

Humphrey, H. B. The marine biological laboratory of the Leland Stanford Jr. University. Plant World **10**: 245–250. *f. 47–49.* N 1907.

Hus, H. T. A. An abnormal *Odontoglossum Cervantesii*. Ann. Rep. Missouri Bot. Gard. **1907**: 95–97. *pl. 9.* 1907.

Hus, H. T. A. The germination of *Hydrastis canadensis*. Ann. Rep. Missouri Bot. Gard. **1907**: 85–94. 1907. [Illust.]

Hus, H. T. A. Virescence of *Oxalis stricta*. Ann. Rep. Missouri Bot. Gard. **1907**: 99–108. *pl. 10, 11* + *f. 1–4.* 1907.

Kellerman, W. A. Obituary: Professor A. P. Morgan. Jour. Myc. **13**: 233–236. 30 N 1907. [Illust.]

Kellerman, W. A. Saccardo's recent arrangement and nomenclature of the fungi. Jour. Myc. **13**: 242–246. 30 N 1907.

Kneucker, A. Bemerkungen zu den "*Cyperaceae* (exclus. *Carices*) et *Juncaceae* exsiccatae" VI Lieferung 1907. Allgem. Bot. Zeits. **13**: 29–32. F 1907; 48–51. Mr 1907; 65–67. Ap 1907.

Many American species included.

Knight, O. W. Three plants from Maine. Rhodora **9**: 202–204. 26 O 1907.

Lager, J. E. Collecting orchids. Trans. Mass. Hort. Soc. **1907**: 37–49. 1907.

Leather, J. W. Schreiner and Reed on deleterious excretions by roots. Torreya **7**: 220, 221. 19 N 1907.

Leue, A. List of trees growing in the parks of Cincinnati, arranged according to their natural order. Ann. Rep. Park Dept. Cincinnati **1906**: 46–51. 1907.

Liebelsperger, W. H. Some rare and interesting plants of Berks County, Pennsylvania. Torreya **7**: 214–217. 19 N 1907.

Life, A. C. Effect of light upon the germination of spores and the gametophyte of ferns. Ann. Rep. Missouri Bot. Gard. **1907**: 109–122. *f. 1, 2.* 1907.

Lloyd, F. E. Pima Cañon and Castle Rock in the Santa Catalina Mountains. Plant World **10**: 251–259. *f. 50–52.* N 1907.

Loeske, L. Zur Systematik der europaïschen *Brachythecieae.* Allgem. Bot. Zeits. **13**: 1–3. Ja 1907: 21–23. F 1907.
Contains references to American species.

Lorenz, A. Notes from Waterville, New Hampshire — II. Bryologist **10**: 102, 103. 2 N 1907.

Lovejoy, A. O. The place of Linnaeus in the history of science. Pop. Sci. Mo. **71**: 498–508. D 1907.

Lutz, A. M. A preliminary note on the chromosomes of *Oenothera Lamarckiana* and one of its mutants, *O. gigas.* Science II. **26**: 151, 152. 2 Au 1907. [Illust.]

Mazza, A. Saggio di algologia oceanica. Nuova Notar. **18**: 1–36. Ja 1907; 67–98. Ap 1907; 126–152. Jl 1907; 177–195. O 1907.

Moore, S. L. Alabastra diversa — Part XIV. 4. Note on some South American plants. Jour. Bot. **45**: 404–406. 1 N 1907.
Includes *Jacaranda Roberti* sp. nov., native of Brazil.

Morgan, A. P. North American species of *Agaricaceae.* The *Melanosporae.* Jour. Myc. **13**: 53–62. 30 Ap 1907; 143–153. 25 Jl 1907; 246–255. 30 N 1907.

Murrill, W. A. *Polyporaceae.* N. Am. Fl. **9**: 1–72. 19 D 1907.

Nash, G. V. The Ames collection of orchids. Jour. N. Y. Bot. Gard. **8**: 250–252. N 1907.

Nash, G. V. A visit to Letchworth Park. Torreya **7**: 209–214. 19 N 1907.

Norén, C. O. Zur Entwicklungsgeschichte des *Juniperus communis.* Uppsala Univ. Arsk. Mat. & Natur. **1907**[1]: 1–64. *pl. 1–4.* 1907.

Norton, A. H. The dwarf mistletoe on the southeastern coast of Maine. Rhodora **9**: 208. 26 O 1907.

Pace, L. Fertilization in *Cypripedium.* Bot. Gaz. **44**: 353–374. 16 N 1907. [Illust.]

Petrak, F. Zur Systematik der Gattung *Adoxa.* Allgem. Bot. Zeits. **13**: 92–94. Je 1907.

Ramaley, F. Plant zones in the Rocky Mountains of Colorado. Science II. **26**: 642, 643. 8 N 1907.

Reed, H. S. The value of certain nutritive elements to the plant cell. Ann. Bot. **21**: 501–543. *f. 1, 2.* O 1907.

Reichenbach, F. *Echinocactus Fričii.* Monats. Kakteenk. **17**: 174, 175. 15 N 1907.
Native of Argentina.

Robinson, C. B. Botrychiums in sand. Torreya **7**: 219, 220. 19 N 1907.

Rolfe, R. A. *Cattleya labiata.* Orch. Rev. **15**: 335, 336. N 1907.
Native of Brazil.

Rolfe, R. A. *Cycnoches Egertonianum.* Orch. Rev. **15**: 337–340. *f. 37.* N 1907.
Native of Guatemala.

Rolfe, R. A. *Paphiopedilum* × *Olivia.* Orch. Rev. **15**: 297, 298. *f. 33.* O 1907.

Rosenstock, E. Beiträge zur Pteridophytenflora Südbrasiliens. Hedwigia **46**: 145–167. 15 F 1907.
Includes descriptions of new species in *Elaphoglossum* (4) and *Danaea* (2).

Saunders, C. F. Flowers of a dry land. Am. Bot. **13**: 27–30. O 1907.

Schrenk, H. von. Branch cankers of *Rhododendron.* Ann. Rep. Missouri Bot. Gard. **1907**: 77–80. 1907. [Illust.]

Schrenk, H. von. Disease of sycamore trees. Plant World **10**: 265. N 1907.

Schrenk, H. von. On frost injuries to sycamore buds. Ann. Rep. Missouri Bot. Gard. **1907**: 81–83. *pl. 7.* 1907.

Schuster, J. Zur Systematik von *Castalia* und *Nymphaea.* Bull. Herb. Boiss. II. **7**: 853–868. 30 S 1907; 901–916. 31 O 1907.

Setchell, W. A. Two new hypogaeous *Secotiaceae.* Jour. Myc. **13**: 236–241. *pl. 107.* 30 N 1907.
Secotium tenu pes and *Elasmomyces russuloides* spp. nov., natives of California.

Stephani, F. Species *Hepaticarum.* Bull. Herb. Boiss. II. **7**: 837–852. 30 S 1907.

Stevens, F. L. Two interesting apple fungi. Science II. **26**: 724, 725. 22 N 1907.

Stevens, W. C. Plant anatomy from the standpoint of the development and functions of the tissues, and handbook of micro-technic. i–xii. 1–349. *f. 1–136.* Philadelphia, 1907.

Trelease, W. Additions to the genus *Yucca.* Ann. Rep. Missouri Bot. Gard. **1907**: 225–230. *pl. 12–17.* 1907.
Includes descriptions of two new species of *Yucca*, natives of Mexico.

Trelease, W. *Agave macroacantha* and allied Euagaves. Ann. Rep. Missouri Bot. Gard. **1907**: 231–256. *pl. 18–34.* 1907.

Vinson, A. E. Some observations on the date. Plant World **10**: 259–262. N 1907.

Warnstorf, C. Neue europaïschen und aussereuropaïschen Torfmoose. Hedwigia **47**: 76–112. 30 S 1907. [Illust.]
Includes descriptions of 14 new American species of *Sphagnum*.

Whetzel, H. H. Some bacterial diseases of plants: their nature and treatment. Trans. Mass. Hort. Soc. **1907**: 117–130. 1907.

Wilkinson, T. J. Breaking into botany. Am. Bot. **13**: 36, 37. O 1907.

Winslow, E. J. Notes on spore dispersal in *Sphagnum*. Bryologist **10**: 111. 2 N 1907.

Wooton, E. O. & Standley, P. The genus *Androsace* in New Mexico. Bull. Torrey Club **34**: 517–520. 17 D 1907.
Includes descriptions of two new species.

Young, R. T. The forest formations of Boulder County, Colorado. Bot. Gaz. **44**: 321–352. *f. 1–12*. 16 N 1907.

INDEX TO VOLUME 34

New names, and the final members of new combinations, are in **bold face type.**

Abies Douglasii, 591
Abrams, L. R. Studies on the flora of Southern California, 263
Acanthorhynchus, 313; **Vaccinii,** 314
Acanthospermum australe, 368
Acer, 284; dasycarpum, 369; platanoides, 234; rubrum, 367; saccharinum, 369
Acerates, 205
Acnida cannabina, 79; tamariscina, 79; tamariscina tuberculata, 78
Acrocryphaea Coffeae, 573
Acropterygium, 250, 251
Acrostichum furcatum, 243, 257
Adenostegia **ciliosa,** 35; ramosa, 35
Adenostoma fasciculatum, 264; fasciculatum densifolium, 263
Aecidium Amorphae, 590; **Boehmeriae,** 590; candidum, 64; **Cannonii,** 210; **fluxum,** 590; Ipomoeae, 69; Ipomoeae-panduranae, 68; **Petalostemonis,** 589; Sarcobati, 210; Urticae, 591
Aeschynomene virginica, 364
Aesculus glabra, 349; Pavia, 352
Agaricus amboinensis, 477; bulbosus, 348; campestris, 302; **Pattersonae,** 347
Ageratum conyzoides, 74
Agrostis, 585, 607; hyemalis, 584; perennans, 584; Thurberiana, 585
Albugo, 61, 63, 65, 73, 77, 82, 84, 387; Bliti, 62, 64, 76, 77, 79, 81, 82; brasiliensis, 74; candida, 61, 63, 64, 68, 69, 77, 81; Cruciferarum, 63; Ipomoeae-panduranae, 61, 64, 68, 81; Lepigoni, 61, 64, 71, 81; **occidentalis,** 62, 64, 80, 81; platensis, 62, 64, 77, 79, 81, 82; Portulacae, 62, 64, 77, 81, 83; quadrata, 64, 76; **sibirica,** 61, 63, 68; Solivae, 74; spinulosa, 73; **Swertiae,** 62, 64, 72, 81; **Tillaeae,** 64, 76; Tragopogonis, 62, 64, 70, 72, 74, 76, 81; **tropica,** 61–63, 68, 81, 82
Albugo, The genus, 61
Alnus rugosa, 367
Alopecurus, 398
Alyssum, 183; macrocarpum, 181
Amaranthus, 77, 82; Bigelovii, 78; blitoides, 78; Blitum, 77, 79; crispus, 79; emarginatus, 78; graecizans, 78; hybridus, 78, 81; hybridus paniculatus, 79; Palmeri, 78; retroflexus, 78; spinosus, 78; tristis, 79; viridis, 79
Amauroderma **Elmerianum,** 475
Ambrosia artemisiaefolia, 75, 364, 404; psilostachya, 75, 404; trifida, 75, 404
Amelanchier, 461; alnifolia, 462, 463; oreophila, 463
America, Mosses from tropical, 569
American botanical literature, Index to (1901–1905), 51; (1906), 105, 267, 575; (1907), 161, 213, 319, 379, 439, 483, 521, 609
American Code of Botanical Nomenclature, 167
American ferns, 243
American fossil mosses, 139
American species of Antrophyum, 445
Amorpha canescens, 590; herbacea, 365
Ampelopsis quinquefolia, 408; Ritchii, 409; Veitchii, 409
Anchistea virginica, 367
Andromeda floribunda, 352; **grandifolia,** 204, 206; latifolia, 204; Novae-Caesareae, 204; Parlatorei, 188, 203, 204, 206
Andropogon tener, 373
Androsace, 517–520; arizonica, 519; diffusa, 517–520; **glandulosa,** 518, 519; occidentalis, 517–520; pinetorum, 517–519; **platysepala,** 518, 519; puberulenta, 518, 519; septentrionalis, 517, 518; subulifera, 518
Androsace in New Mexico, 517
Antennaria plantaginifolia, 76
Anthostomella, 313; **destruens,** 313; Smilacis, 313
Antrophyopsis, 447
Antrophyum, 445–458; anetioides, 449, 455; Boryanum, 447; brasilianum, 448, 449, 452, 454–456; carnosum, 449; cayennense, 448, 449, 453; Desvauxii, 457; discoideum, 448, 449, 454, 455; **Dussianum,** 449, 453; ensiforme, 448–450; falcatum, 449; Feei, 451, 452; Galeottii, 449; giganteum, 457; immersum, 447; **Jenmani,** 449, 453, 454; lanceolatum, 445, 448, 449, 451, 452, 454; lineatum, 448–452; minimum, 457; reticulatum, 445; spathulatum, 452, 453; subsessile, 448, 452–455, 457; Wercklеanum, 458

Antrophyum, The genus, 445
Apeibopsis discolor, 199
Arabis, 429; Drummondii alpina, 437; furcata, 65; glabra, 68; longirostris, 429; Lyallii, 437; lyrata, 65; **oreophila,** 437; rostrata, 429; virginica, 65
Aragallus, 423; **angustatus,** 422; argophyllus, 423; **atropurpureus,** 424; Besseyi, 422–424; Blankinshipii, 422–424; collinus, 423, 424; Lagopus, 423; Lambertii, 421–424; monticolus, 424; multiceps, 423; nanus, 423; **patens,** 421; sericeus, 421, 424
Aralia, 201; groenlandica, 201; **Newberryi,** 201, 206; palmata, 201; spinosa, 352, 366
Arenaria marina, 72
Aristida stricta, 351, 365
Armillaria, 104; **ventricosa,** 104
Aronia arbutifolia, 365
Artemisia biennis, 75; canadensis, 76; ludoviciana, 405
ARTHUR, J. C. New species of Uredineae, 583
Asclepias, 221; Cornuti, 239; lanceolata, 364
Asimina triloba, 103
Aspergillus niger, 303
Aster Novae-Angliae, 394; oblongifolius, 394; sagittifolius, 394; squarrosus, 365
Astragalus, 49; atratus, 48; campestris, 49, 50; convallarius, 49; divergens, 417; Haydenianus, 420; multiflorus, 419; tegetarius, 421
Atlantic coastal plain, Mesozoic flora of the, 185
Atriplex, 82
Avena sativa, 286, 287
Avrainvillea, 491, 505–508, 512, 513; laetivirens, 512; levis, 508, 512; longicaulis, 504, 508–512; Mazei, 504, 509, 511, 512; nigricans, 504, 505, 508–512, 515; **Rawsoni,** 508, 510, 511, 516; sordida, 512
Avrainvillea, Further notes on Halimeda and, 491
Aytonia **Evansii,** 57–59; **jamaicensis,** 58, 60
Aytonia from Jamaica, Two new species of, 57
Azolla caroliniana, 364

Barbarea Barbarea, 65
BARNHART, J. H. A new Utricularia from Long Island, 579
Basidiophora, 388, 393; entospora, 393; **Kellermanii,** 393, 394, 405
Batodendron arboreum, 364
Bazzania, 561
BENEDICT, R. C. The genus Antrophyum, 445
BERRY, E. W. Contributions to the Mesozoic flora of the Atlantic coastal plain, 185
Beta, 82
Betula atavina, 193; nigra, 367
Bidens cernua, 404; comosa, 405; connata, 405; frondosa, 404; laevis, 404
Bignonia crucigera, 364
Blitum, 82; capitatum, 81, 82
Boehmeria cylindrica, 591
Boerhaavia anisophylla, 80; decumbens, 80, 81; diffusa, 80; erecta, 80; hirsuta, 80; paniculata, 80; Sonorae, 80; spicata, 80; viscosa, 80; Xanti, 80
Boletus, 86; pavonius, 468
Bonamia, 143, 146, 147; alternifolia, 146; aquatica, 149; grandiflora, 146; humistrata, 148; ovalifolia, 146; Pickeringii, 149
Botanical literature, American (1901–1905), 51; (1906), 105, 267, 575; (1907), 161, 213, 319, 379, 439, 483, 521, 609
Botanical Nomenclature, American Code of, 167
Bothrodiscus, 312; **pinicola,** 313
Botrytis, 498; cana, 408; intestans, 391, 408; macrospora, 401; nivea, 401; viticola, 407, 408; vitis-viticola, 407
Bouteloua oligostachya, 208; prostrata, 208
Brachysteleum, 141
Bradburya virginiana, 364
Brassica, 66; arvensis, 66; campestris, 66; integrifolia, 66; Napus, 68; nigra, 65, 66; oleracea, 68
Breweria, 146, 147; angustifolia, 148; aquatica, 149; Choisyana, 148; grandiflora, 146; humistrata, 148; mexicana, 144; ovalifolia, 146; Pickeringii, 149; rotundifolia, 149; tenella, 148; trichosanthes, 148; villosa, 149
BRITTON, E. G. & HOLLICK, A. American fossil mosses, with description of a new species from Florissant, Colorado, 139
Bruguiera caryophylloides, 272; eriopetala, 272
Bryolejeunea, 558
Bryonia, 222, 330, 339, 340; alba, 222; dioica, 222, 331
Bryonopsis lacunosa erythrocarpa, 414
Bryopteris, 4, 533, 557–559, 561, 564, 566; diffusa, 557–559, 561; filicina, 557–559, 563–566, 568; fruticulosa, 565; Gaudichaudii, 558; tenuicaulis, 559, 565, 566; trinitensis, 566; trinitensis intermedia, 566
Bryum, 571; argenteum, 570

BURLINGHAM, G. S. Some Lactarii from Windham County, Vermont, 85
Bursa, 65; Bursa-pastoris, 65, 66, 68

Caeoma Amaranthi, 77; convolvulatum, 68; **occidentale,** 591
Cakile edentula, 68; maritima, 66
California, Studies on the flora of Southern, 263
Calliospora **Petalostemonis,** 588
Callistolejeunea, 553
Calonyction aculeatum, 70
Calycobolus, 143; **amazonicus,** 145; emarginatus, 144; **ferrugineus,** 145; **glaber,** 145; **Pringlei,** 144, 145; pulchellus, 145; **sericeus,** 144, 145; **spectabilis,** 146; **umbellatus,** 146; **velutinus,** 144, 145
Camelina microcarpa, 65, 66; sativa, 66
Campulosus aromaticus, 363, 365
Campylopus concolor, 569; **Pittieri,** 569
Canadian Rocky Mountains, Two new willows from the, 157
Capnoides **brachycarpum,** 426; Cusickii, 426; **hastatum,** 426
Capsella Bursa-pastoris, 181, 182
Carallia integerrima, 272
Cardamine bulbosa, 66
Carduus, 73; arvensis, 75; lanceolatus, 75; muticus, 75; spinosissimus, 75
Carex, 151, 587; **agrostoides,** 607; australis, 151; **austrina,** 151, 152; **brevisquama,** 152; filiformis, 587; foetida, 606; Gayana, 603–605; Gayana hyalina, 603; glaucescens, 365; Goodenovii, 587; Hookeriana, 153–155; hyalina, 603; incurva, 606; **latebrosa,** 603, 604, 607; marcida, 603–605; Muhlenbergii, 152; Muhlenbergii australis, 151, 152; Muhlenbergii austrina, 151; **neomexicana,** 153, 154; occidentalis, 153, 154; **perglobosa,** 606; **simulata,** 603–605; spectabilis, 587; stenophylla, 605; **tumulicola,** 154, 155; vallicola, 153; vernacula, 606; verrucosa, 587; vulgaris, 587
Carex, Notes on, 151, 603
Carolinas and Virginia, A midsummer journey through the coastal plain of the, 351
Carpinites microphyllus, 193
Cassia, 230; tomentosa, 239
Castalia odorata, 183, 364
Castanea dentata, 306
Castilleja **amplifiora,** 39; **arcuata,** 35; Bradburyi, 39; cognata, 36; desertorum, 37, 41; fasciculata, 41; **gracillima,** 39; hispida, 39; **humilis,** 37; lanceolata, 37, 38; lauta, 37; **Leonardi,** 36; linariaefolia, 36; lutea, 40; lutescens, 37, 41; **magna,** 36; miniata, 38; occidentalis, 40; pallida, 40; **parvula,** 40; **Pecten,** 41; **pulchella,** 40, 41; **purpurascens,** 38; rhexifolia, 36, 37; rupicola, 39; Suksdorfii, 36; Tweedyi, 38; **variabilis,** 37; **viscida,** 38; **Vreelandii,** 38
Castasetum maculatum, 120; maculatum luteopurpuratum, 120
Caudalejeunea, 533, 553, 557; Cresentiae, 554, 556; Haenkeana, 554; harpaphylla, 554; **Lehmanniana,** 554, 557, 566, 567; Leiboldii, 554, 556, 557
Caulanthus, 428, 436; crassicaulis, 436; hastatus, 436
Celastrophyllum crenatum, 197, 206; Newberryanum, 197; undulatum, 197
Celtis occidentalis, 416
Centaurea, 405
Ceratolejeunea, 8, 10, 15, 17, 22; Breutelii, 13; brevinervis, 7, 15; **portoricensis,** 15, 17, 33; valida, 15
Ceratophyllum submersum, 183
Cercis canadensis, 364
Ceriops Candolleana, 272
Ceuthospora, 312; **lunata,** 312
Chaetochloa italica, 396; macrosperma, 586; verticillata, 397; viridis, 396
Chamaebatia **australis,** 263; foliosa australis, 263
Chamaecyparis thyoides, 377
Cheiranthus, 68; asper, 66; pacificum, 66
Chenopodium, 82; rubrum, 82
Chloris elegans, 207, 397
Chlorocrambe, 435; **hastata,** 436
Chloroplegma, 508
Chondrophora nudata, 365
Chondrophyllum Nordenskioeldii, 198, 206; orbiculatum, 198
Cinnamomum, 200; Heerii, 188, 200, 206; intermedium, 200
Cissites acuminatus, 200; affinis, 200; Brownii, 200; harkerianus, 200; Heerii, 200
Citrullus vulgaris, 414
Cladium mariscoides, 581
Cladocephalus, 513; scoparius, 513
Cladosporium **Oxycocci,** 306
Cladothrix lanuginosa, 79
Clavaria amethystina, 102; **amethystinoides,** 102; Schaefferi, 102
Claytonia linearis, 317
Clethra alnifolia, 367
Cliftonia, 352, 358; monophylla, 361
Clinterium, 309, 310; obturatum, 309
Clitocybe **nobilis,** 97

Closterium Brebissonii, 599; granulatum, 600; laeve, 600
Coastal plain of the Carolinas and Virginia, A midsummer journey through the, 351
Cobaea, 226, 230; scandens, 239
Coccinia indica, 414
Code of Botanical Nomenclature, American, 167
Collybia dryophila, 345; **hirticeps,** 98; **subsulphurea,** 345; zonata, 98
Colocasia antiquorum, 390
Cololejeunea, 3, 5, 8; floccosa, 12
Colorado, Description of new fossil moss from, 139
Coltricia cinnamomea, 465; perennis, 466
Colura, 533
Comptonia vindobonensis, 192
Concerning some West American fungi, 207
Coniosporium, 84
Coniothyrium, 593
Contributions to the Mesozoic flora of the Atlantic coastal plain, 185
Convolvulaceae, Studies in the North American, 143
Convolvulus aquaticus, 149; erianthus, 149; humistratus, 147, 148; incanus, 70; Pickeringii, 149; sepium, 71; Sherardi, 148; tenellus, 148; trichosanthes, 148
Cook, M. T. The embryology of Rhizophora Mangle, 271; The embryology of Rhytidophyllum, 179
Corallina discoidea, 495; incrassata, 501; Flabellum, 495; tridens, 501
Coriolopsis **aneba,** 466; **badia,** 466; **dermatodes,** 466; occidentalis, 466; **phocina,** 466; **semilaccata,** 466
Coriolus, 468; abietinus, 467; atypus, 467; **cuneatiformis,** 467; elongatus, 467; **maximus,** 467; **murinus,** 467; **vernicipes,** 468
Cornus florida, 366
Coronopus, 68
Cortinarius, 86
Corydalis Brandegei, 426
Corymbis flava, 114
Costa Rican orchids, 113
Crataegus Cerronis, 462; punctata, 311; saligna, 462
Credneria, 199, 200; denticulata, 199; Zenkeri, 199
Cressa, 143
Crucianella, 228
Cucumis angulatus, 414; Anguria, 415; Melo, 414; odoratissimus, 414; sativus, 333, 415
Cucurbita, 222, 342; maxima, 415; moschata, 225; ovifera, 415; Pepo, 222, 225, 415
Cucurbitaceae, Some features of pollen-formation in the, 221
Cucurbitaria, 349; **erratica,** 349; Sorbi, 349
Cushman, J. A. A synopsis of the New England species of Tetmemorus, 599
Cyathula lappulacea, 79
Cyclanthera, 222, 224, 225, 237, 241, 334; explodens, 223; Hystrix, 406; pedata, 222
Cyclodictyon **cubense,** 574; limbatum, 574; Regnellii, 574
Cyclomycetella, 468
Cycloporellus, 468; **cichoriaceus,** 468; **microcyclus,** 468
Cycnoches Rossianum, 121; Warscewiczii, 121
Cynodon dactylon, 208
Cyperus Iria, 364; rotundus, 364
Cyrilla, 352; racemiflora, 365, 370
Cystispora endophylla, 312
Cystopus, 63; Amaranthacearum, 77; Amaranthi, 77; argentinus, 71, 72; Bliti, 77; brasiliensis, 73; candidus, 64, 69; Convolvulacearum, 69; Convolvulacearum Swertiae, 72; cubicus, 73; Cyathulae, 77; Euphorbiae, 84; Ipomoeae-panduranae, 69; Lepigoni, 71; Mikaniae, 73, 74; platensis, 79; Portulaceae, 83; pulverulentus, 73, 74; Salsolae, 84; Schlechteri, 84; sibiricus, 68; spinulosus, 73, 74; Tillaeae, 76; Tragopogonis, 69, 74; Tragopogonis spinulosus, 73; tropicus, 68

Daedalea amanitoides, 480; applanata, 480; Hobsoni, 480; Palisoti, 480; repanda, 480; sanguinea, 468
Dendroalsia abietina, 12
Dendrolejeunea, 552
Dentaria diphylla, 65, 66; laciniata, 66
Dewalquea groenlandica, 194
Dichromena latifolia, 365
Dicranella Perrottetii, 569
Dicranodontium **setosum,** 570
Dicranolejeunea, 4
Dicranopteris, 243–247, 250; **arachnoides,** 249; **Bancroftii,** 251-253, 258; **bicolor,** 251, 252; **Brunei,** 251, 253; **costaricensis,** 251, 253; **cubensis,** 251, 253; dichotoma, 257; **farinosa,** 252, 254; **flexuosa,** 251, 254; **fulva,** 252, 255, 256; **furcata,** 252, 257; **gigantea,** 249; **glabra,** 249; **glauca,** 249; **intermedia,** 252, 258; **jamaicensis,** 251, 258; **linearis,** 250, 255; **lon-**

gissima, 249; **mellifera,** 251, 259; **orthoclada,** 251, 259, 261; **palmata,** 252, 259; **pectinata,** 247, 250, 251, 260; **pteridella,** 251, 260; **retroflexa,** 251, 260; **strictissima,** 252, 261
Dicranostyles, 143; scandens, 143
Dicranum frigidum, 569; speciosum, 569
Dicrypta iridifolia, 121
Dictyogramme ensiformis, 449; lanceolata, 451
Diholcos Haydenianus, 420; **micranthus,** 420
Dinema paleaceum, 118
Diospyros primaeva, 188, 204
Diplasiolejeunea, 3
Diplopterygium, 249, 251
Dothiorella **aberrans,** 103; Asiminae, 103
Draba caroliniana, 68
Drepanolejeunea, 22
Dufourea, 144; glabra, 145; sericea, 144

Earliella **corrugata,** 468
Ecballium, 337
Eccilia Acuà, 100; **cinericola,** 347; **Subacus,** 100; **unicolor,** 99
Echinochloa colona, 364
Echinospermum Lappula, 68
EDGERTON, C. W. Notes on a parasitic Gnomonia, 593
Eleocharis Robbinsii, 581
Elfvingia **Elmeri,** 476; tornata, 476
Elleanthus **caricoides,** 119, 124
Embryo of Zea Mays, An occurrence of glands in the, 125
Embryology of Rhizophora Mangle, The, 271
Embryology of Rhytidophyllum, The, 179
Entodon macropodus, 573
Entoloma **deminutivum,** 99; **modestum,** 347; **murinum,** 98; Peckianum, 99; sericeum, 99
Epidendrum auritum, 118; cochleatum, 117; lineare, 116; ochraceum, 118; paleaceum, 118; Stamfordianum, 118
Epilobium, 401
Equisetum, 226, 231, 240, 398
Erechtites hieracifolia, 404
Erigeron annuus, 404; philadelphicus, 394, 404; ramosus, 394
Eriocaulon decangulare, 365; septangulare, 581
Erysibe sphaerica Caryophyllacearum, 71
Eucalyptus, 202; attenuata, 203; Geinitzi, 201–203, 206; **linearifolia,** 203; nervosa, 203
Euosmolejeunea, 20; trifaria, 32
Eupatorium, 404; ageratoides, 404; compositifolium, 364; purpureum, 404, 406; rotundifolium, 366
Euphorbia eriogonoides, 364, 370; maculata, 364, 370
Eurotia lanata, 211
EVANS, A. W. Hepaticae of Puerto Rico, 1, 533
Evolvulus, 143, 149; ovalifolius, 146; prostratus, 149; rotundifolius, 149
Excretions by roots, The production of deleterious, 279

Fagus americana, 364, 366, 372
Favolus tenuis, 469; Wightii, 469
Features of pollen-formation in the Cucurbitaceae, 221
Ferns, Amercian, 243
Fevillea, 223–225, 237, 241; cordifolia, 223
Ficus, 199; daphnogenoides, 188, 194, 206; inaequalis, 194, 206; Woolsoni, 194, 206
Flabellaria luteofusca, 513
Flammula **betulina,** 100
Flora of Southern California, Studies on the, 263
Florissant, New species of fossil moss from, 139
Fomes Cornu-bovis, 478; **luzonensis,** 476; melanoporoides, 478; **philippinensis,** 477; pullus, 479; pyrrhocreas, 478; semilaccatus, 466; semitostus, 477
Fontinalis, 140; pristina, 139, 142
Fossil mosses, American, 139
Fouquieria splendens, 210
Fradelia, 508; fuliginosa, 508
Franseria tenuifolia, 75
Frasera, 72
Fraxinus caroliniana, 364
Frullania, 2, 4, 7, 539, 558, 566; dichotoma, 558; diffusa, 558; filicina, 558, 563; spathulistipa, 558
Fuckelia, 313
Funalia **philippinensis,** 469; **versatilis,** 469
Funaria calvescens, 570; hygrometrica, 570
Fungi, Concerning some West American, 207
Fungi, New species of, 97, 305, 345
Further notes on Halimeda and Avrainvillea, 491

Gaertneria acanthocarpa, 75; discolor, 76
GAGER, C. S. An occurrence of glands in the embryo of Zea Mays, 125
Ganoderma amboinense, 477; **subtor-**

natum, 477; **Williamsianum,** 478
Genus Albugo, The, 61
Genus Androsace in New Mexico, The, 517
Genus Antrophyum, The, 445
Geranium carolinianum, 400; dissectum, 400; maculatum, 400; pusillum, 400; Richardsonii, 400; Robertianum, 400
Gibbera, 310; obturata, 310
Glands in the embryo of Zea Mays, An occurrence of, 125
Gleditsia aquatica, 364
Gleichenia, 243, 244, 247, 260; axialis, 258; Bancroftii, 252, 258; bicolor, 252; bifida, 249; brevipubis, 262; Brunei, 253; dichotoma, 248, 255; farinosa, 254; flexuosa, 254; furcata, 257, 260; gigantea, 249; glaucina, 261; intermedia, 258, 261; intermedia dissitifolia, 259; intermedia flexuosa, 260; Liebmanni, 261; linearis, 250; longissima, 248, 249; Matthewsii, 259; mellifera, 259; orthoclada, 259; palmata, 259; pectinata, 248, 260; pteridella, 260; pubescens, 248–250, 253, 260; retroflexa, 260; revoluta, 253; rigida, 255; strictissma, 261; trachyrhizoma, 262
Gleicheniaceae, Preliminary review of the North American, 243
Gloephyllum **edule,** 480
Gloeosporium, 593; **minus,** 315
Glomerella, 315; rufomaculans **Vaccinii,** 314, 316
Glottidium vesicarium, 364
Glyphomitrium, 141; **Cockerelleae,** 140, 142
Glyptostrobus Ungeri, 140
Gnaphalium purpureum, 404; spathulatum, 404
Gnomonia, 593–597; Rubi, 594–597; tetraspora Rubi, 596; veneta, 595
Gnomonia, Notes on a parasitic, 593
Gomontia polyrhiza, 507
Gonolobus, 411, 412
Gordonia Lasianthus, 365, 369
Gossypium, 230
Grayia polygaloides, 591; spinosa, 591
GRIFFITHS, D. Concerning some West American fungi, 207
Guignardia Bidwellii, 316; **Vaccinii,** 316
Guillenia, 429, 430; longirostris, 430; rostrata, 429
Gutierrhezia **bracteata,** 265; divergens, 265
Gymnosporangium, 459; **Betheli,** 459, 462; clavipes, 461; **durum,** 460; globosum, 461; **inconspicuum,** 461, 463; Libocedri, 463
Gymnosporangium and Roestelia, New western species of, 459
Gyrotheca tinctoria, 365

Habenaria, 585; blepharigottis, 365, 581; cristata, 365; gracilis, 585
Halimeda, 491, 493, 495, 496, 499; cuneata, 494, 498, 499; discoidea, 495–500, 514, 515; favulosa, 501, 502, 504; gracilis, 491, 500; incrassata, 501, 503; incrassata ovata, 503; Lessonii, 497; macroloba, 491, 496; Monile, 499, 501, 502, 504; Opuntia, 494, 499; papyracea, 495–497; platydisca, 491, 497, 500; scabra, 492, 494, 500, 502, 504; **simulans,** 503, 504, 516; tridens, 493, 494, 501–504, 515; Tuna, 491–500, 502, 504, 514, 515; Tuna f. platydisca, 497
Halimeda and Avrainvillea, Further notes on, 491
Hamosa **atrata,** 48; **atratiformis,** 48
Hapalopilus gilvus, 470; licnoides, 470; **subrubidus,** 470
Haplocladium microphyllum, 574
Haplosporella, 103
HARPER, R. M. A midsummer journey through the coastal plain of the Carolinas and Virginia, 351
HAYNES, C. C. Two new species of Aytonia from Jamaica, 57
Hecisopteris **minima,** 457, 458; pumila, 458; Werckleana, 458
Hedera, 198, 201; primordialis, 201, 206
Hedysarum Mackenzii, 425; **utahense,** 424
Helianthus, 404–406; annuus, 404; divaricatus, 404; doronicoides, 405; grosseserratus, 405; hirsutus, 405; Maximiliani, 405; occidentalis, 405; scaberrimus, 405; strumosus, 405; trachaelifolius, 405; tuberosus, 127, 135, 136, 405
Helicosporium **Tiliae,** 103
Heliocarpus, 402; americanus, 402
Helminthosporium **inaequale,** 307
Helvella, 102
Hemionitis, 445; brasiliana, 452; cajannensis, 453; gigantea, 457; lanceolata, 451; lineata, 450
Hepaticae of Puerto Rico, 1, 533
Herberta, 561, 562
Herpestis verticillaris, 76
Hesperidanthus, 431, 434; **linearifolius,** 434
Hesperis, 430; matronalis, 66
Heteropterygium, 250, 251
Heterothrix, 432, 435; **longifolia,** 435; **micrantha,** 435
Hexagona cervinoplumbea, 469; ciliata,

470; cucullata, 470; orbiculata, 469; Thwaitesii, 469; **vibecinoides,** 470; Wightii, 469
Hibiscus, militaris, 364, 369, 373
Hibiscus militaris, 364, 369, 373
HOLLICK, A. & BRITTON, E. G. American fossil mosses, with description of a new species from Florissant, Colorado, 139
Holomitrium **Maxoni,** 572; proliferum, 573; Wrightii, 573
Holopterygium, 249–251
Homalobus brachycarpus, 49; campestris, 49, 50, 417; camporum, 50, 417, 418; decurrens, 50, 418; dispar, 419; **divergens,** 50, 417, 418; hylophilus, 50; **humilis,** 417; junceus, 49; junciformis, 49; **microcarpus,** 417; **oblongifolius,** 50, 418; **paucijugus,** 418; simplicifolius, 49; **stipitatus,** 419; **strigulosus,** 419, 420; tenellus, 418–420; tenuifolius, 50; **uniflorus,** 49
Homalolejeunea, 544
Hookeriopsis gracilis, 571
Hordeum vulgare, 135
HOUSE, H. D. Studies in the North American Convolvulaceae, 143
HOWE, M. A. Phycological studies, 491
Hydnum **Kauffmani,** 348; **sulcatipes,** 101
Hymenophyllum, 12; ciliatum, 11
Hypericum fasciculatum, 364
Hypnum, 140; Brownii, 139, 142; columbianum, 140, 142; Haydenii, 139, 140, 142
Hypocopra, 314

Ibervillea, 329–335, 339, 340; Sonorae, 329, 330, 338, 340, 343
Ibervillea Sonorae, The stem of, 329
Ilex glabra, 367
Impatiens, 403; aurea, 403; biflora, 403; Nolitangere, 403
Index to American botanical literature (1901–1905), 51; (1906), 105, 267, 575; (1907), 161, 213, 319, 379, 439, 483, 521, 609
Inocybe **decipientoides,** 100; decipiens, 101
Inonotus **Elmerianus,** 471
Inula salicina, 74
Iodanthus linearifolius, 430, 434; pinnatifidus, 66
Ipomoea Batatas, 70; carolina, 70; incarnata, 71; Jalapa, 71; lacunosa, 70; leptophylla, 70; mexicana, 70; pandurana, 71; pandurata, 71, 81; Pes-caprae, 71; simulans, 71; triloba, 71
Irpex maximus, 467
Isochilus linearis, 116
Iva, 405; ambrosiaefolia, 75; ciliata, 75; xanthiifolia, 395, 405

Jamaica, Two new species of Aytonia from, 57
Journey through the coastal plain of the Carolinas and Virginia, A midsummer, 351
Jubula, 4, 566
Juglandites, 192
Juglans cinerea, 284
Juncus biflorus, 374; effusus, 364; scirpoides compositus, 374
Jungermannia, 557; birotunda, 18; brachiata, 546; cucullata, 12; dilatata, 558; filicina, 557, 558, 563–565; filiformis, 18; geminiflora, 18; granulata, 539; incrassata, 540; Mackaii, 543; spathulistipa, 558; squamata, 5; subfusca, 26; Tamarisci, 558; transversalis, 534, 537; trinitensis, 566
Juniperus californica utahensis, 460, 461; communis, 140; scopulorum, 460; virginiana, 364

Kalmia, 204; Brittoniana, 204
Kawakamia, 393
Kentrophyta **minima,** 420; **tegetaria,** 421; Wolfii, 421
KERN, F. D. New western species of Gymnosporangium and Roestelia, 459
KIRKWOOD, J. E. Some features of pollen-formation in the Cucurbitaceae, 221
KNOX, A. A. The stem of Ibervillea Sonorae, 329
Koeleria, 209

Lactarii from Vermont, Some, 85
Lactarius, 85–95; affinis, 90, 94; alpinus, 90, 94; **aspideoides,** 87, 93; aspideus, 87; **Bensleyae,** 87, 95; camphoratus, 90, 95; Chelidonium, 93; cilicioides, 94; cinereus, 90, 94; circellatus, 86, 90, 94; deceptivus, 86, 90, 95; deliciosus, 90, 93; distans, 95; flexuosus, 90, 95; fuliginosus, 91, 93; Gerardii, 91, 95; griseus, 88, 91, 95; hysginus, 91, 94; Indigo, 93; insulsus, 94; **isabellinus,** 88, 93; ligniotus, 91, 93; **minusculus,** 88, 94; **nitidus,** 89, 95; **oculatus,** 86, 89, 95; pallidus, 95; paludinellus, 91, 95; pargamenus, 94; parvus, 91, 94; piperatus, 86, 94; pyrogalus, 91, 94; regalis, 86; resimus, 86, 91, 93; rimosellus, 86, 91, 95; **rufulus,** 346; rufus, 94, 346; subdulcis, 86, 89–91, 95; subdulcis oculatus, 89; subpurpureus, 91, 93;

theiogalus, 92, 93; torminosus, 92, 93; trivialis, 94; turpis, 92, 94; uvidus, 92, 93, 102; vellereus, 92, 95; volemus, 92, 95; **xanthogalactus,** 346; zonarius, 94
Laelia acuminata, 118; peduncularis, 118; rubescens, 118
Lagenaria vulgaris, 415
Larix, 226–228, 231, 237, 239
Lathyrus **brachycalyx,** 425; decapetalus, 425
Laurophyllum, 189
Laurus, 188, 189
Lavatera, 230, 239
Lejeunea, 4, 18, 533, 558; barbiflora, 540; Bongardiana, 546, 548, 549; brachiata, 546, 548; Breutelii, 7, 8, 43; catenulata, 7, 8, 10–12; complicata, 546; Crescentiae, 554, 556, 557; eulopha, 22; filicina, 563; filiformis, 18; floccosa, 12; geminiflora, 18; granulata, 539; Guilleminiana, 546, 548, 549; Haenkeana, 554; harpaphylla, 553, 554, 556, 557; incrassata, 540, 542; Lehmanniana, 553, 554, 556; Leiboldii, 554; Mariei, 30, 32; Montagnei, 20; Muelleriana, 27, 29, 30; portoricensis, 8, 10, 15; Sagraeana, 30; seminervis, 7, 8; squamata, 5; subfusca, 26, 27, 30; taeniopsis, 539, 540; tenuifolia, 18; transversalis, 537; transversalis Hookeriana, 540; vincentina, 542
Lemna, 364; minor, 302
Lentinus, 104; ventricosus, 104
Lenzites applanata, 480; Palisoti, 480; pallida, 480; platypoda, 480; repanda, 480
Leotia chlorocephala, 103; **punctipes,** 102
Lepidium alyssoides, 427; Bourgeauanum, 428; **brachybotryum,** 427; campestre, 65, 68; **Crandallii,** 427; densiflorum, 66, 428; Eastwoodiae, 427; **Fletcheri,** 428; Jonesii, 427; montanum, 427; ruderale, 428; sativum, 68; scopulorum, 427; virginicum, 66
Lepigonum medium, 81
Lepiota cepaestipes, 97; **xylophila,** 97
Leptilon canadense, 394
Leptochloa mucronata, 208; viscida, 208
Leptodontium brevisetum, 572; **perannulatum,** 572
Leptothyrium **Oxycocci,** 311
Leskea microphylla, 574
Lilium, 228, 231; Catesbaei, 365
Limnobium Spongia, 364
Limnorchis stricta, 585
Limonium, 368; carolinianum, 368; Nashii, 368
Lindera, 189
Liquidambar styraciflua, 367
Liriodendron, 196, 197; **dubium,** 196, 206; Meekii, 196; oblongifolium, 196; primaevum, 196, 197; semialatum, 196; Tulipifera, 206, 367
Liriodendropsis, 196, 197; angustifolia, 196; simplex, 196
Literature, American botanical (1901–1905), 51; (1906), 105, 267, 575; (1907), 161, 213, 319, 379, 439, 483, 521, 609
Long Island, A new Utricularia from, 579
Lophodermium melaleucum, 309; Oxycocci, 309
Lopholejeunea, 1, 21–23, 29, 32, 535, 536, 550, 553, 557; Anderssonii, 21; dentistipula, 32; eulopha, 22, 32; fimbriata, 32; **Howei,** 30, 32, 34; Muelleriana, 24, 27, 29, 30, 32, 34; Sagraeana, 24, 26–30, 32, 33
Loxogramme, 445; lineata, 450
Ludwigia maritima, 368; suffruticosa, 364; virgata, 369
Lupinus amplus, 41, argenteus, 43, 45; argenteus argophyllus, 43; Bakeri, 44; brevicaulis, 45; canescens, 43; decumbens, 44; dichrous, 44; **flavicaulis,** 43; foliosus stenophyllus, 42; holosericeus, 43; laxiflorus, 41, 42; **laxispicatus,** 42; leucophyllus, 44; Lyallii, 45; **Macounii,** 42; **macrostachys,** 44; **marianus,** 41; oreophilus, 43; ornatus glabratus, 41; pseudoparviflorus, 41; pusillus, 45, 46; **roseolus,** 44; **rubens,** 45; **scaposus,** 45; Scheuberae, 42; **stenophyllus,** 42; **subulatus,** 43; tenellus, 42
Lycopersicon Lycopersicon, 392
Lycopodium, 139, 140; rupestre, 377
Lysiostyles, 143; scandens, 143

MACKENZIE, K. K. Notes on Carex, 151, 603
Macromitrium Husnoti, 573
Macrophoma **tiliacea,** 348
Macropodium, 429; laciniatum, 429; nivale, 429
Madia sativa, 405
Magnolia, 188; amplifolia, 195; Capellinii, 188, 195, 206; glauca, 367, 371; grandiflora, 364, 371; longifolia, 195; macrophylla, 196; **Newberryi,** 195, 206; obtusata, 195
Malapoenna, 189
Malvastrum densiflorum, 264, 265; **viscidum,** 264
Marasmius, 98
Marchantia polymorpha, 240

Marchesinia, 533, 543–546; Bongardiana, 546; brachiata, 546, 548, 549, 567; Guilleminiana, 546; Mackaii, 544, 545; robusta, 546
Marshallia graminifolia, 365
Mastigolejeunea, 533, 549, 550, 552, 557, 559; auriculata, 549, 551, 552; crispula, 550
Matricaria, 73; matricarioides, 75
Maxillaria iridifolia, 121; **Valenzuelana,** 121
Maximowiczia, 330, 334; Sonorae, 330
Melica imperfecta, 209
Melothria, 225, 237; scabra, 415
Mertensia, 243, 260; arachnoides, 249; farinosa, 254; flexuosa, 254; fulva, 255; furcata, 257; glabra, 249; glaucescens, 250; gleichenioides, 261; grandis, 257, 258; palmata, 259; pectinata, 260; pubescens, 255; rigida, 254; subtrisperma, 254
Mesosorus, 243
Mesozoic flora of the Atlantic coastal plain, 185
Micrampelis, 223, 225, 227–229, 231, 234, 236, 237, 241, 242; lobata, 223, 406, 415
Microchloa indica, 208
Microporellus **subdealbatus,** 471
Microporus Perula, 472
Microthamnium reptans, 571; thelistegum, 574; Tuerckheimii, 571
Midsummer journey through the coastal plain of the Carolinas and Virginia, 351
Momordica balsamina, 415; charantia, 415
Montia linearis, 317; minor, 317
Mosses, Fossil, 139
Mosses from tropical America, 569
Mukia scabrella, 415
MURRILL, W. A. Some Philippine Polyporaceae, 465
Myrica, 191, 192; acuta, 191; brookensis, 191; callicomaefolia, 192; carolinensis, 373, 374; cerifera, 367, 373, 374; **elegans,** 191, 206; Gale, 374; Newberryana, 191; praecox, 191; pumila, 365; raritensis, 191; rigida, 192
Myrtophyllum, 202; Geinitzi, 201, 202; Warderi, 202, 203
Myrtus caryophyllata, 1

NASH, G. V. Costa Rican orchids, 113
Naucoria semiorbicularis, 101; **sororia,** 101; tabacina **bicolor,** 347
Neckera abietina, 11, 12; undulata, 573
Neottia flava, 114
Neslia paniculata, 67
Neurolejeunea, 1, 3, 5, 7, 8, 10, 15, 17; **Breutelii,** 13, 15, 33; catenulata, 9, 10, 12, 13, 15, 17, 33; portoricensis, 15; seminervis, 15
New England species of Tetmemorus, 599
New Mexico, The genus Androsace in, 517
New species of Aytonia from Jamaica, 57
New species of fossil moss from Florissant, 139
New species of fungi, 97, 305, 345
New species of Uredineae, 583
New Utricularia from Long Island, 579
New western species of Gymnosporangium and Roestelia, 459
New willows from the Canadian Rocky Mountains, 157
Nigrofomes melanoporus, 478
Nigroporus **durus,** 471; vinosus, 471
Nitrophila, 210; occidentalis, 210
Nomenclature, American Code of Botanical, 167
North American Convolvulaceae, 143
North American Gleicheniaceae, 243
North American Peronosporales, 61, 387
North Carolina, Contributions to the Mesozoic flora of, 185
Notarisia, 141
Notes on Carex, 151, 603
Notes on Halimeda and Avrainvillea, 491
Notes on a parasitic Gnomonia, 593
Nymphaea advena, 183; fluviatilis, 371
Nyssa biflora, 352, 367; Ogeche, 358; sylvatica, 352; uniflora, 367

Occurrence of glands in the embryo of Zea Mays, 125
Octoblepharum albidum, 570
Odontolejeunea, 2, 5, 536, 537
Oidium, 408
Omphalanthus, 1, 17, 18, 20; filiformis, 18, 20, 21, 33; geminiflorus, 18, 21
Omphalia, 98; **curvipes,** 345; grisea, 98; integrella, 345; pusillissima, 345; **serotina,** 98; **vestita,** 345
Omphalolejeunea, 18
Onoclea polypodioides, 243
Orchids, Costa Rican, 113
Ornithocephalus, 123
Orobus dispar, 419
Oxalis Wrightii, 264
Oxydendrum arboreum, 366
Oxygraphis Cymbalaria, 584
Oxypolis filiformis, 364
Oxytropis argentata, 424; Besseyi, 422, 424; monticola, 424
Ozonium auricomum, 305; **omnivorum,** 305

Pachypodium, 429, 430; integrifolium, 429, 433; laciniatum, 429; linearifolium, 434; sagittatum, 429
Panicum caespitosum, 209; digitarioides, 364; hebotes, 586; molle, 586
Parasitic Gnomonia, Notes on a, 593
Parietaria pennsylvanica, 407
Parthenium, 73; integrifolium, 75; repens, 75
Parthenocissus quinquefolia, 408; tricuspidata, 409
Passiflora incarnata, 364
PECK, C. H. New species of fungi, 97, 345
Peckiella hymenii, 102; **hymenioides,** 102
Pedicularis bracteosa, 35; Canbyi, 35; **siifolia,** 35
Peltandra undulata, 239
Peltolejeunea, 20
Penicillus, 513
Peperomia pellucida, 68, 81
Peronoplasmopara, 412, 413; Celtidis, 415; cubensis, 413
Peronospora, 395, 398, 399, 412, 413; australis, 406; Cactorum, 390; Celtidis, 415; conglomerata, 400; Conii, 401; cubensis, 412, 413; entospora, 393; Epilobii, 401; Geranii, 399; Gonolobi, 411; graminicola, 396; graminicola Setariae-italicae, 396; Halstedii, 403; Halstedii Ambrosiae, 403; illinoensis, 407; Impatientis, 402, 403; infestans, 389, 391; Kellermanii, 394; macrocarpa, 401; macrospora, 401; nivea, 401; nivea Geranii, 399; obducens, 402; ribicola, 410; sicyicola, 406; simplex, 394; Umbelliferarum, 401; viticola, 398, 407
Peronosporales, North American, 61, 387
Petalostemon, 589; candidus, 589; multiflorus, 589; oligophyllus, 589; purpureus, 589; villosus, 589; violaceus, 589
Phacidium, 308
Phalaris arundinacea, 398
Pharbitis hederacea, 71; purpurea, 71
Phaseolus lunatus, 390
Philippine Polyporaceae, 465
Phoenix dactylifera, 136
Phoma cystisporea, 312; leptidea, 308
Phoradendron flavescens, 367
Phragmicoma, 543; Bongardiana, 546, 548, 567; catenulata, 10, 12; catenulata incompleta, 12; filiformis, 18; granulata, 539; Guilleminiana, 546, 548; Haenkeana, 554, 556, 557; ocellulata, 5; transversalis, 537
Phragmites, 190, 191, 206
Phragmolejeunea, 552
Phragmopyxis, 590
Phycological studies, 491
Phyllosticta **putrefaciens,** 307
Phytophthora, 388, 389, 391; Cactorum, 389, 390; Colocasiae, 389, 390; infestans, 389, 391, 392, 408; Nicotianae, 389, 390; omnivora, 391; Phaseoli, 389, 390; **Thalictri,** 389, 392
Pieris floribunda, 352; nitida, 352
Pinckneya, 358
Pinus, 284; echinata, 366, 367; Elliottii, 360–362, 364, 373, 375; insularis, 481; palustris, 351, 360, 361, 375, 376; rigida, 376; serotina, 351, 362, 367, 376; Taeda, 358, 360, 361, 367, 375, 376; virginiana, 313
Pisum, 231
Plagiochasma elongatum, 58; Wrightii, 59
Plagiorhabdus, 310; **Crataegi,** 310, 311; **Oxycocci,** 311
Planera, 193, 373; aquatica, 364, 372; betuloides, 193; **cretacea,** 193, 206; Ungeri, 193
Plasmopara, 394, 395, 398, 399, 412, 413; australis, 406; Celtidis, 415; cubensis, 413; entospora, 394, 395; Epilobii, 401; Geranii, 399; Gonolobi, 411; Halstedii, 403; Heliocarpi, 402; Impatientis, 402; Kellermanii, 394; nivea, 401; obducens, 402; pusilla, 400; ribicola, 410; Viburni, 410; Vincetoxici, 411, 412; viticola, 408
Platanus, 373; affinis, 200; Heerii, 200; occidentalis, 364, 370, 372
Platylejeunea, 534; granulata, 539; transversalis, 537; vincentina, 542
Platyzoma, 243, 244
Pleurophragma, 431, 433; **gracilipes,** 433; **integrifolium,** 433, 434; **platypodum,** 434
Pleurothallis minax, 115, 116; plumosa, 115, 116; polyliria, 115; Valenzuelana, 121, 122
Poa, 584; arida, 584; nevadensis, 584
Poacites, 190
Pogonatum tortile, 571
Pollen-formation in the Cucurbitaceae, 221
Polygala cymosa, 364; lutea, 365, 370; ramosa, 365
Polymnia Uvedalia, 364
Polypodium dichotomum, 243, 250, 255; furcatum, 257; glaucum, 249; lineare, 250, 255
Polyporaceae, Some Philippine, 465
Polyporus affinis, 472; albomarginatus, 478; anebus, 466; atypus, 467; aureomarginatus, 470; australis, 476;

bicolor, 466; bivalvis, 469; breviporus, 470; brunneolus, 467; caliginosus, 478; carneoniger, 472; celebicus, 471; cervino-gilvus, 466; cinereofuscus, 478; **coracinus,** 471; corrugatus, 468; dermatodes, 466; discipes, 470; durus, 471; elongatus, 467; endotheius, 478; fastuosus, 479; fuscobadius, 468; grammocephalus, 472; holosclerus, 470; incomptus, 472; intybaceus, 468; iodinus, 468; Kermes, 478; laeticolor, 478; lanatus, 466; mariannus, 468; Meyenii, 467; microcyclus, 468; murinus, 467; ostreaeformis, 474; **palensis,** 472; pectinatus, 479; Peradeniae, 466; Perula, 472; phocinus, 466; polychrous, 472; scabrosus, 468; scorteus, 466; setiporus, 468; spadiceus, 470; surinamensis, 473; tornatus, 476; vernicipes, 468; vibecinoides, 470; vibecinus, 473; Wightii, 469; xanthopus, 472; zonalis, 473; zonalis semilaccatus, 466
Polypremum procumbens, 364
Polystictus badius, 466; cichoriaceus, 468; cilicioides, 470; Didrichsenii, 467; Persoonii, 468
Polytaenium, 447–449; lanceolatum, 450; lineatum, 450
Polytrichadelphus ciliatus, 571
Ponera amethystina, 116
Pontederia cordata, 364
Populites affinis, 200
Populus 364, 373; deltoides, 373
Porana, 143; velutina, 144
Portulaca oleracea, 81, 83
Potentilla, 284; fruticosa, 284
Preliminary review of the North American Gleicheniaceae, 243
Prevostea, 143, 144; amazonica, 145; ferruginea, 145; glabra, 145; sericea, 144, 145; spectabilis, 146; umbellata, 146; velutina, 144
Production of deleterious excretions by roots, 279
Prospodium Amphilophii, 588; appendiculatum, 588; **bahamense,** 587
Protomyces graminicola, 396
Prunus, 284
Psathyrella **betulina,** 101; **caespitosa,** 348
Pseudoperonospora, 389, 399, 412, 413; **Celtidis,** 407, 413, 415; cubensis, 406, 413
Pseudoplasmopara, 413
Pseudotsuga Douglasii, 591; mucronata, 591
Pteridium aquilinum, 367
Pteris dichotoma, 243, 257
Pterocaulon undulatum, 365
Pterospermites, 188, 199; **carolinensis,** 198, 206; cordifolius, 199; **credneriifolius,** 199, 206; modestus, 199
Ptychanthus, 4, 566
Ptychocoleus, 543
Ptychomitrium, 141
Puccinia, 585, 587; Agrostidis, 584; Caricis, 591; **Chaetochloae,** 585; **cinerea,** 583; coronata, 585; epiphylla, 584; eslavensis, 586; **Eurotiae,** 210; Gonolobi, 411; minuta, 587; **minutissima,** 587; **panicicola,** 586; **perminuta,** 584; Petalostemonis, 589; Poarum, 584; **praegracilis,** 585; **quadriporula,** 586; Rhamni, 585
Puerto Rico, Hepaticae of, 1, 533
Pycnoporus sanguineus, 473
Pyropolyporus **albomarginatus,** 478; **caliginosus,** 478; **endotheius,** 478; **fastuosus,** 479; **lamaensis,** 479; **Merrillii,** 479; **pectinatus,** 479; **Williamsii,** 479

Quamoclit Quamoclit, 71
Quercophyllum, 193
Quercus, 188, 192, 193; alba, 366; Catesbaei, 351, 367, 372; cinerea, 365; coccinea, 306; digitata, 367; Ellsworthiana, 192; geminata, 361; Johnstrupi, 192, 193; Marioni, 192; marylandica, 367; minor, 366; Phellos, 366, 367; **Pratti,** 192, 206; sphenobasis, 192; virginiana, 364; Wardiana, 192

Raphanus sativus, 65, 67, 81
Ravenelia, 592
Reboulia hemisphaerica, 58
REED, H. S. & SCHREINER, O. The production of deleterious excretions by roots, 279
Reinwardtia, 144; glabra, 145; sericea, 145
Reseda, 65
Review of the North American Gleicheniaceae, 243
Rhabdospora **Oxycocci,** 311
Rhexia Alifanus, 365
Rhinotrichum **Sumstinei,** 103
Rhipilia longicaulis, 508–510; Rawsoni, 510; tomentosa, 512
Rhizogonium spiniforme, 571, 573
Rhizophora Mangle, 271; mucronata, 272
Rhizophora Mangle, The embryology of, 271
Rhizopus, 285

Rhus, 192; acuminata, 192; copallina, 366
Rhynchostegium conchophyllum, 571; Knowltoni, 140, 142
Rhysotheca, 389, 398, 399, 413; **australis,** 399, 406, 407; **Epilobii,** 399, 401; **Geranii,** 399; **Gonolobi,** 399, 411; **Halstedii,** 399, 403; **Heliocarpi,** 399, 402; **illinoensis,** 399, 407; **obducens,** 399, 402; **ribicola,** 399, 410; **Umbelliferarum,** 399, 401; **Viburni,** 399, 410; **viticola,** 399, 407
Rhytidophyllum, 179; crenulatum, 179, 183, 184; tomentosum, 179, 183, 184
Rhytidophyllum, The embryology of, 179
Ribes albinervum, 411; divaricatum, 411; hirtellum, 411; oxycanthoides, 411; prostratum, 411; rotundifolium, 411; rubrum, 411; rubrum subglandulosum, 411
Ricinus, 128; communis, 135
Rigidoporus **surinamensis,** 473
Rocky Mountain flora, Studies on the, 35, 417
Rocky Mountains, Two new willows from the Canadian, 157
Roestelia, 459; **Betheli,** 461; **Harknessiana,** 462, 463; **Harknessianoides,** 463
Roestelia, New western species of, 459
Roots, The production of deleterious excretions by, 279
Roripa Armoracia, 65, 67; hispida, 67; Nasturtium, 68; obtusa, 67; palustris, 67; sessiliflora, 67; Walteri, 67
ROWLEE, W. W. Two new willows from the Canadian Rocky Mountains, 157
Rubus nigrobaccus, 593, 594
Rudbeckia fulgida, 394; laciniata, 405; triloba, 405
Russula, 86
RYDBERG, P. A. Studies on the Rocky Mountain flora, 35, 417
Rynchospora corniculata, 364; fusca, 581; semiplumosa, 375

Sabal glabra, 364
Sabbatia campanulata, 364; lanceolata, 365
Sabina scopulorum, 460; utahensis, 460, 461
Sagittaria variabilis, 183
Salix, 157, 189; **albertana,** 157, 158; Barrattiana, 158; Barrattiana angustifolia, 158; glaucops, 159; lucida, 159; **Maccalliana,** 158; nigra, 367; Tweedyi, 158; wyomingensis, 157
Sambucus canadensis, 364
Sarcobatus, 210
Sarracenia flava, 365, 371; minor, 365
Sassafras, 201; acutilobum, 201; harkerianum, 200; hastatum, 201; variifolium, 369
Saururus cernuus, 183
Schoenocrambe linifolium, 67
Schomburgkia, 118
SCHREINER, O. & REED, H. S. The production of deleterious excretions by roots, 279
Sclerospora, 388, 395; **Farlowii,** 207, 396, 397; graminicola, 396, 397; Kriegeriana, 398; macrospora, 398; Magnusiana, 398
Scoliosorus, 447–450; ensiformis, 449
Secale, 221
Selaginella acanthonota, 377
Sematophyllum admistum, 574; subsimplex, 571
Senecio, 73; aureus, 76; cymbalaroides, 75; Hartianus, 75; lugens, 76; oblanceolatus, 76; peninsularis, 76; serra, 76; serra integriusculus, 76; tomentosus, 367
Septoria **longispora,** 308
Sequoia heterophylla, 188, 189
Serapias flava, 114
Serenoa, 358; serrulata, 361
SHEAR, C. L. New species of fungi, 305
Sicydium, 330; Lindheimeri, 330
Sicyos angulatus, 406, 415
Sida rhombifolia, 364
Silphium, 221, 239; integrifolium, 405; laciniatum, 405; perfoliatum, 405; terebinthinaceum, 405; trifoliatum, 405
Sinapis alba, 68
Sisymbrium officinale, 67
Smilax lanceolata, 364; laurifolia, 365
Solanum tuberosum, 392
Solidago canadensis, 405; Riddellii, 405; rigida, 394
Some features of pollen-formation in the Cucurbitaceae, 221
Some Lactarii from Vermont, 85
Some Philippine Polyporaceae, 465
Some West American fungi, 207
Sophia andrenarum, 209; brachycarpa, 436; filipes, 436; Hartwegiana, 67; incisa, 67, 436; intermedia, 436; **magna,** 436; millefolia, 67; **Nelsonii,** 436; pinnata, 65, 67, 437
Sordaria, 314
Sorosporium Eriochloae, 209; Montiae, 317; **ovarium,** 209
Southern California, Studies on the flora of, 263

Spartina glabra, 367
Species of Antrophyum, American, 445
Species of Aytonia from Jamaica, 57
Species of fungi, New, 97, 305, 345
Species of Gymnosporangium and Roestelia, New western, 459
Species of Uredineae, New, 583
Sphaeria obturata, 309, 310; obturata epiphylla, 309; obtusata, 309; Sclerotium, 310
Sphaeronema **pomorum,** 307
Sphaeropsis, 309; Asiminae, 103
Sphagnum, 92; medium purpurascens, 569
Spongipellis **luzonensis,** 473
Sporonema, 310; **epiphyllum,** 309; obturatum epiphyllum, 309; **Oxycocci,** 308; phacidioides, 310; **pulvinatum,** 308
Sporotrichum **Quercuum,** 306; sulphureum, 306; sulphureum f. Quercuum, 306
STANDLEY, P. & WOOTON, E. O. The genus Androsace in New Mexico, 517
Stanfordia, 428
Stanleya, 431
Stanleyella, 431, 435; **Wrightii,** 435
Statice caroliniana, 368; Limonium, 368
Stem of Ibervillea Sonorae, 329
Sterculia Saportanea, 200
Stictolejeunea, 1–5, 9, 10, 536, 545, 560; Kunzeana, 1, 3, 7; squamata, 1–3, 5, 7, 13, 33
Streptanthus, 428, 430, 431; linearifolius, 430, 434; longifolius, 435; longirostris, 430; maculatus, 431; micranthus, 435; wyomingensis, 431, 432
Streptochaeta, 126
Stromatopteris, 243, 244
Studies, Phycological, 491
Studies in North American Convolvulaceae, 143
Studies in North American Peronosporales, 61, 387
Studies on the flora of Southern California, 263
Studies on the Rocky Mountain flora, 35, 417
Stylisma, 143, 147, 149; **angustifolia,** 147, 148; aquatica, 148, 149; elliptica, 149; evolvuloides, 148; evolvuloides angustifolia, 149; humistrata, 147, 148; peduncularis, 147, 148; Pickeringii, 148, 149; **rotundifolia,** 148, 149; **trichosanthes,** 147, 148; **villosa,** 148, 149
Swertia, 72; connata, 72, 81
Symbiezidium, 533–535, 537, 544, 545, 550; **barbiflorum,** 540, 542, 567; Breutelii, 13; catenulatum, 10; granulatum, 539, 540; squamatum, 5; transversale, 534, 537, 538, 540–543, 567; vincentinum, 542, 543
Symplocarpus, 228; foetidus, 239
Synopsis of the New England species of Tetmemorus, 599
Syrrhopodon Hobsoni, 573

Taxilejeunea, 18
Taxodium distichum, 352, 367; imbricarium, 364, 376
Tecoma bahamensis, 588; radicans, 364
Tetmemorus, 599–601; Brebissonii, 599, 601; granulatus, 600, 601; laevis, 600, 601; minutus, 600, 601
Tetmemorus, A synopsis of the New England species of, 599
Thalictrum, 234; purpurascens, 234, 392
Thelypodiopsis, 431, 432; **aurea,** 432; **Bakeri,** 432; **elegans,** 432, **wyomingensis,** 432
Thelypodium, 428–431; aureum, 430, 432; Bakeri, 430, 432; elegans, 430, 432; integrifolium, 430, 433, 434; integrifolium gracilipes, 433; laciniatum, 429, 433; lasiophyllum, 429, 430; **leptosepalum,** 432; lilacinum, 434; linearifolium, 430, 434; longifolium, 431, 435; micranthum, 431, 435; **Palmeri,** 432; sagittatum, 433; utahense, 429; Wrightii, 431, 434, 435
Thladiantha, 330, 337, 339, 340
Thlaspi Bursa-pastoris, 68; glaucum, 67; Nuttallii, 67
Thyella tamnifolia, 71
Thysananthus, 552, 557, 558, 560, 566
Tilia americana, 103, 348
Tillaea rubescens, 76
Tillandsia usneoides, 364, 375
Timmiella subanomala, 571
Tissa leucantha, 72; marina, 72
Tium sparsiflorum, 48; **variegatum,** 47
Tofieldia racemosa, 365
Torula, 84
Tragopogon porrifolius, 76, 81
Trametes Aurora, 467; badia, 466; bicolor, 468; **caespitosa,** 473; colliculosa, 480; dermatodes, 466; **lamaensis,** 474; **luzonensis,** 474; Muelleri, 474; nitida, 468; **ostreaeformis,** 474; **subacuta,** 474; versatilis, 469; **Williamsii,** 475
Trichantha, 146
Trichodium, 584
Trichosanthes colubrina, 415

Trichostema lanatum, 265; lanatum denudatum, 265; Parishii, 265
Trifolium **Aitonii,** 46; **confusum,** 46; dasyphyllum, 47; **inaequale,** 47; latifolium, 46; longipes, 46; montanense, 47; Parryi, 47; pedunculatum, 46; Rusbyi, 46; Rydbergii, 46; **uintense,** 47
Triticum, 221; vulgare, 286, 398
Tropical America, Mosses from, 569
Tsuga canadensis, 583, 591; heterophylla, 583; Mertensiana, 583
Two new species of Aytonia from Jamaica, 57
Two new willows from the Canadian Rocky Mountains, 157
Typha latifolia, 364
Tyromyces **Elmeri,** 475

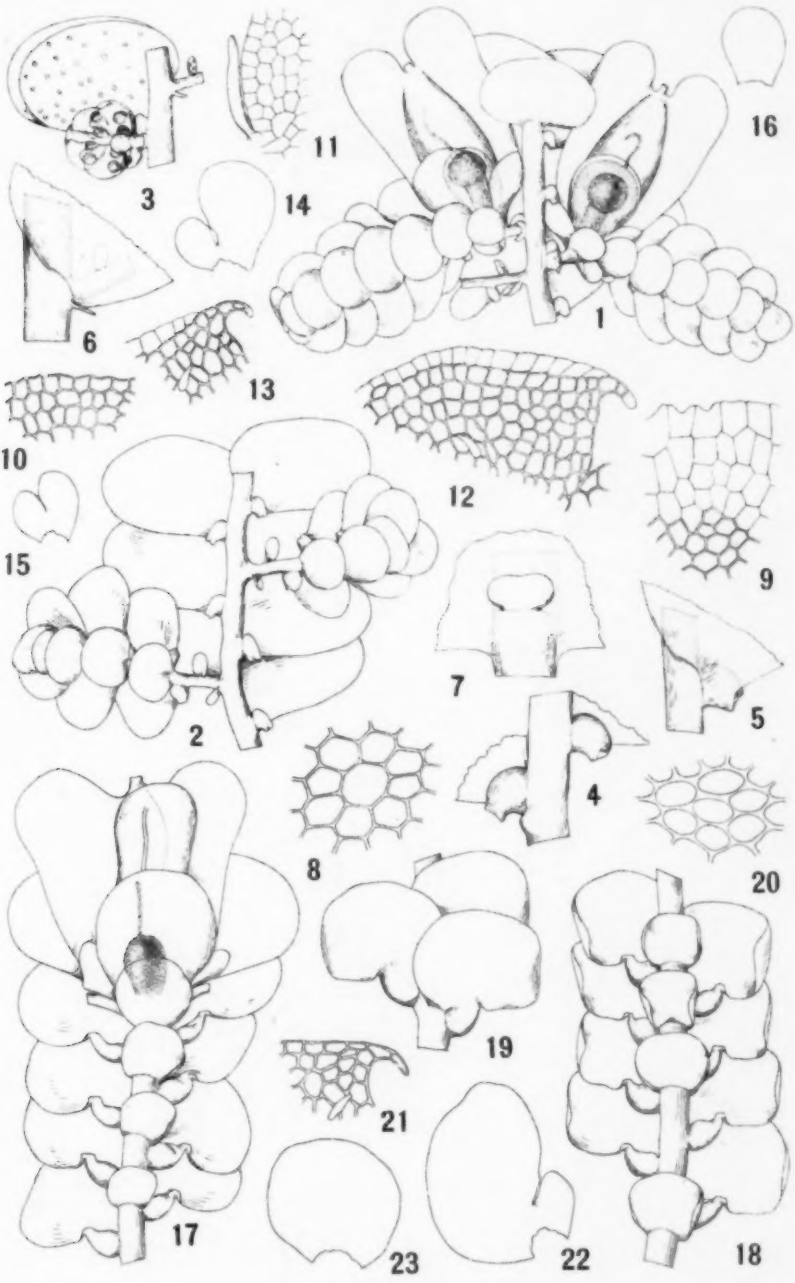
Udotea, 495, 512, 513; conglutinata, 513; Desfontainei, 513; flabellata, 495; Flabellum, 495; luteofusca, 513; tomentosa, 512
UNDERWOOD, L. M. American ferns, 243
Uredineae, New species of, 583
Uredo, 63; Bliti, 77; candida, 63, 64; candida Tragopogi, 72; Chaetochloae, 585; Cheiranthi, 64; Convolvulae, 68; **Grayiae,** 591; Holwayi, 583; **inquirenda,** 592; Portulacae, 83; Tragopogi, 72
Urocystis Agropyri, 209; **Sophiae,** 209
Uropyxis, 589, 590; Amorphae, 590; Petalostemonis, 589, 590
Ustilago Boutelouae, 208; Calandriniae, 317; **Claytoniae,** 317; Cynodontis, 208; heterogena, 208; hypodites, 208; **Microchloae,** 207
Utricularia, 579, 580; cornuta, 579; juncea, 579–581; resupinata, 581; simplex, 581; **virgatula,** 580–582
Utricularia from Long Island, A new, 579

Vaccinium crassifolium, 365; macrocarpum, 307–309, 311, 312, 314–316
Vaucheria geminata, 507; hamata, 507
Verbesina encelioides, 405
Vermont, Some Lactarii from, 85
Vernonia angustifolia, 365; Baldwinii, 405; noveboracensis, 405, 406
Viburnum acerifolium, 410; dentatum, 410; nudum, 410; Opulus, 410; pubescens, 410
Vigna Catjang, 287
Vignea, 151
Vincetoxicum gonocarpos, 412; hirsutum, 411, 412; suberosum, 412
Virginia, A midsummer journey through the coastal plain of, 351
Vitis, 404, 409; aestivalis, 408, 409; bicolor, 409; californica, 409; cinerea, 409; cordifolia, 409; labrusca, 409; riparia, 409; rotundifolia, 364, 409; vinifera, 409; vulpina, 409
Vittaria, 451, 457, 458; costata, 457; lanceolata, 450; lineata, 458

Warscewiczella Wendlandii discolor, 123
Wedelia incarnata, 80
West American fungi, 207
Western species of Gymnosporangium and Roestelia, New, 459
Widdringtonia helvetica, 140
Wilberforcia, 144
WILLIAMS, R. S. Mosses from tropical America, 569
Willows from the Canadian Rocky Mountains, New, 157
WILSON, G. W. Studies in North American Peronosporales, 61, 387
Windham County, Some Lactarii from, 85
WOOTON, E. O. & STANDLEY, P. The genus Androsace in New Mexico, 517

Xanthium canadense, 405
Xanthoxalis **californica,** 264; **Wrightii,** 264
Xylobium foveatum, 121
Xylophacos amphioxys, 49; **aragalloides,** 48
Xylothermia montana **tomentosa,** 263

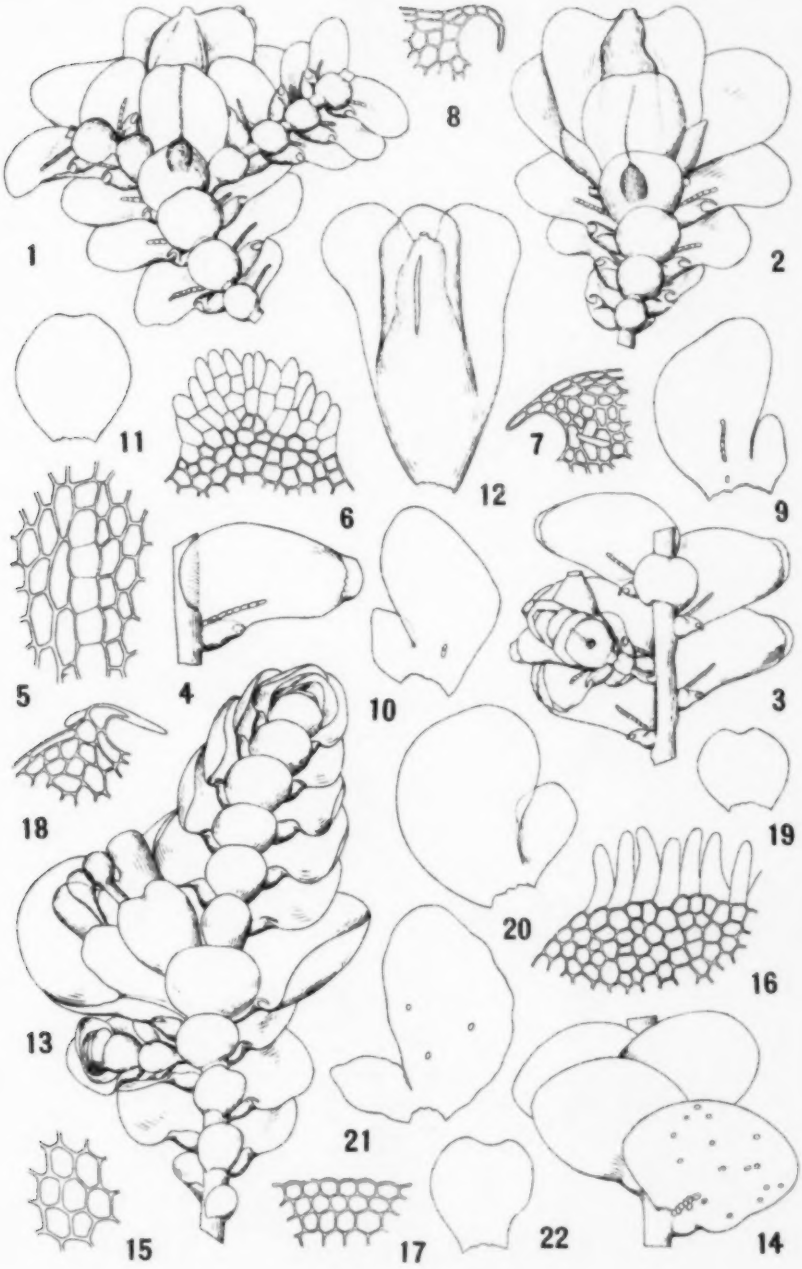
Zea Mays, 125, 132, 136, 287
Zea Mays, An occurrence of glands in the embryo of, 125
Zostera, 221; marina, 240
Zygadenus glaberrimus, 365
Zygostates, 123; **costaricensis,** 122, 124



1-16. STICTOLEJEUNEA SQUAMATA (Willd.) Schiffn.

17-23. NEUROLEJEUNEA BREUTELII (Gottsche) Evans.

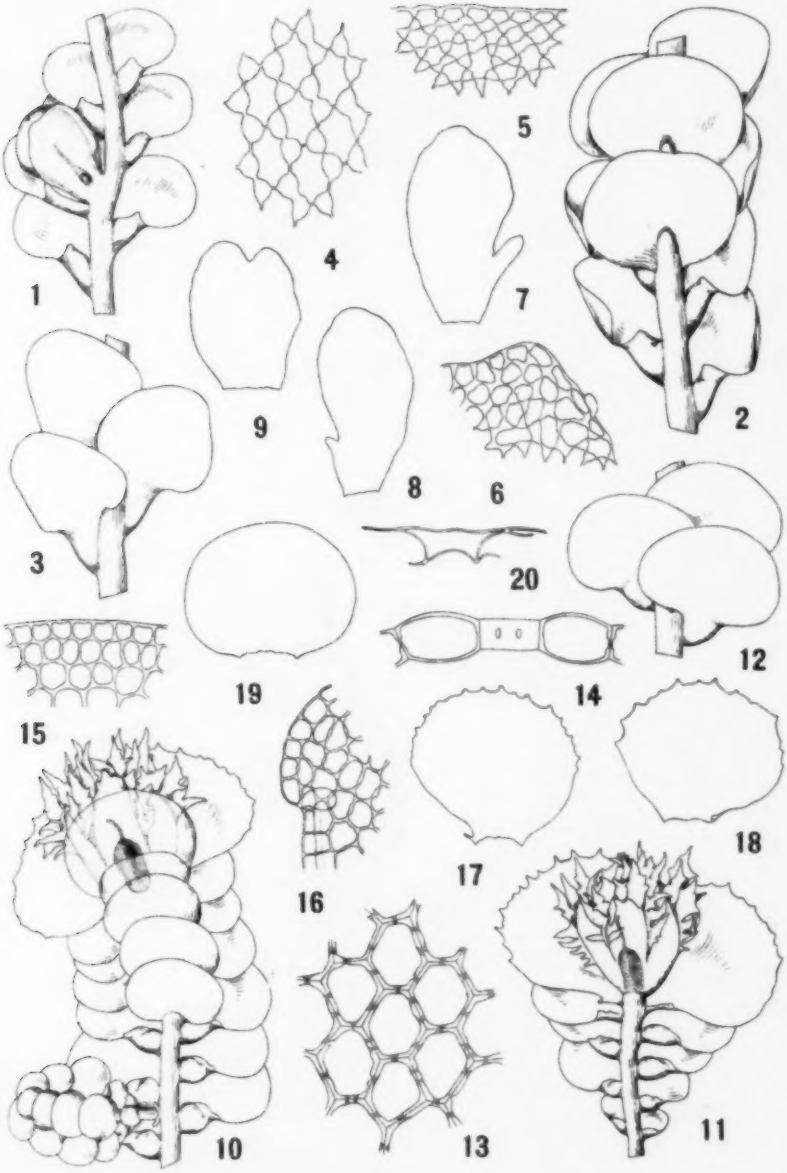
HELIOTYPE CO., BOSTON.



1-12. NEUROLEJEUNEA CATENULATA (Nees) Schiffn.

13-22. CERATOLEJEUNEA PORTORICENSIS (Hampe & Gottsche) Evans.

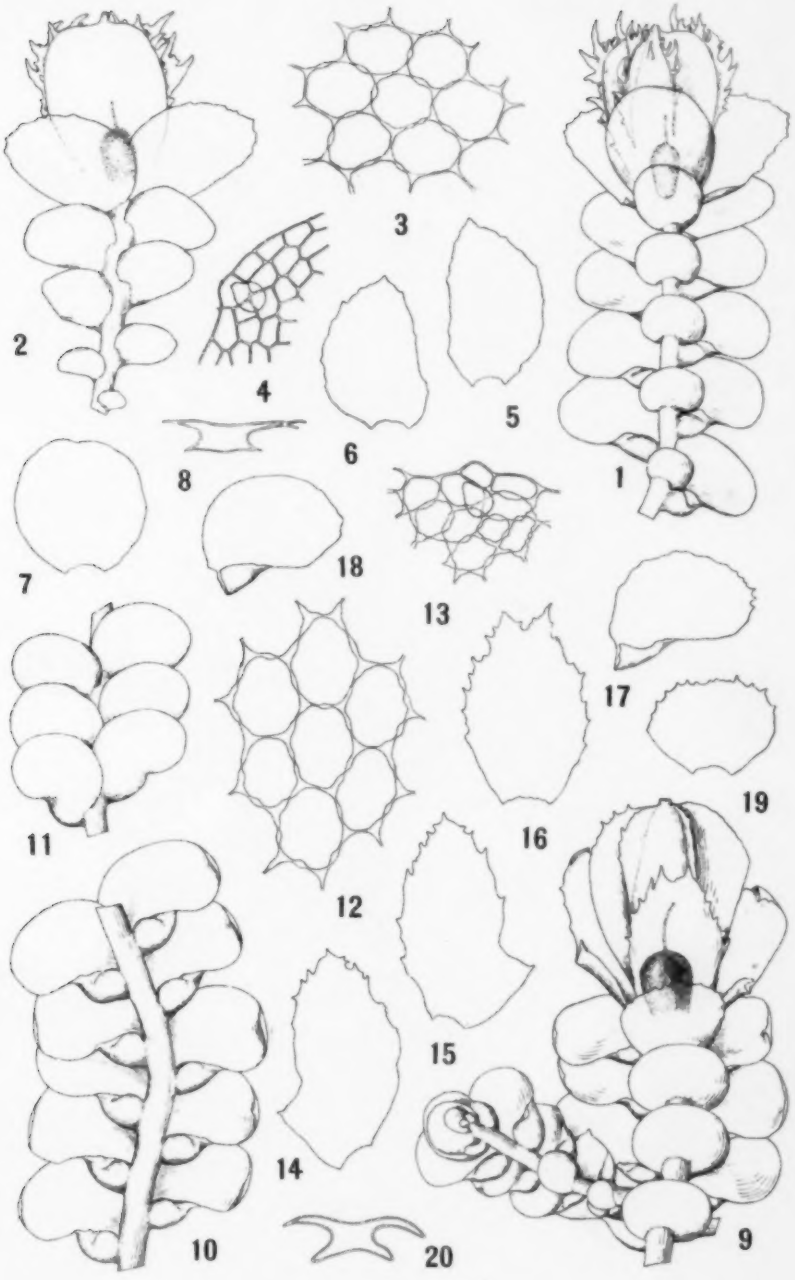
HELIOTYPE CO., BOSTON.



1-9. OMPHALANTHUS FILIFORMIS (Swartz) Nees.

10-20. LOPHOLEJEUNEA SAGRAEANA (Mont.) Schiffn.

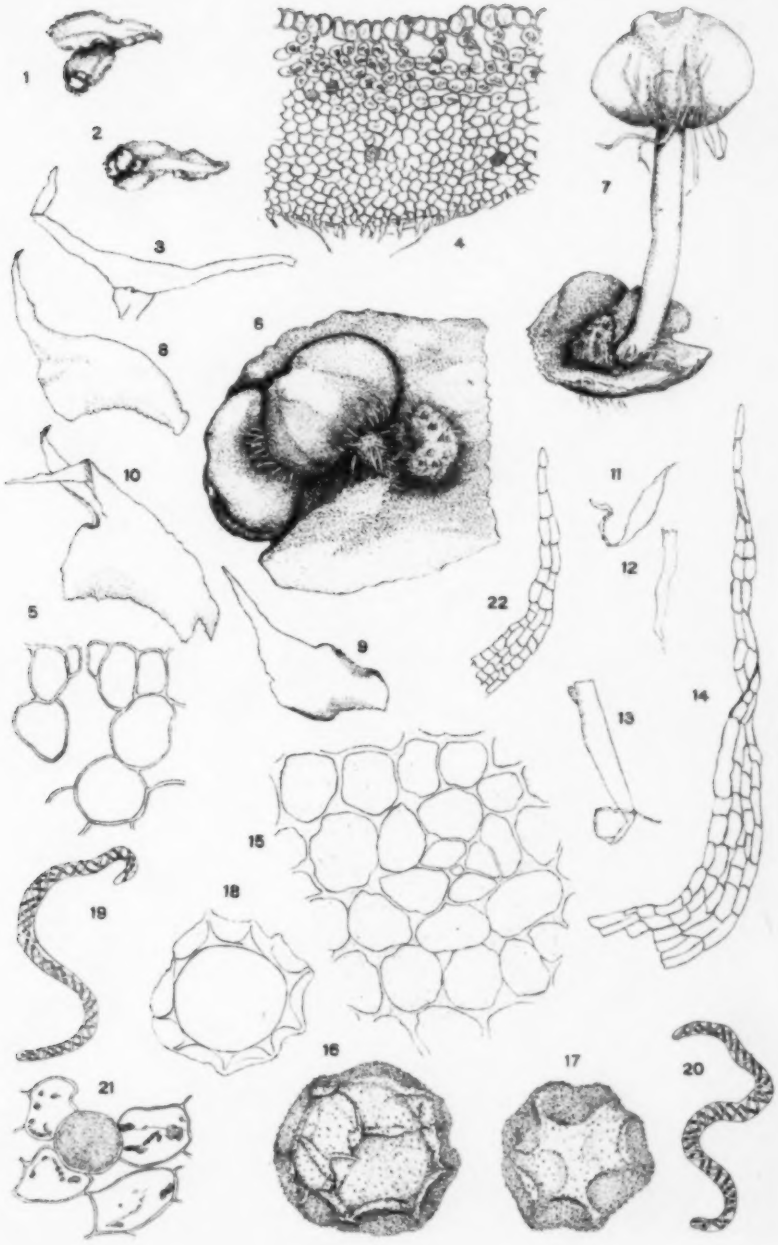
HELIOTYPE CO., BOSTON.



1-8. LOPHOLEJEUNEA MUELLERIANA (Gottsche) Schiffn.

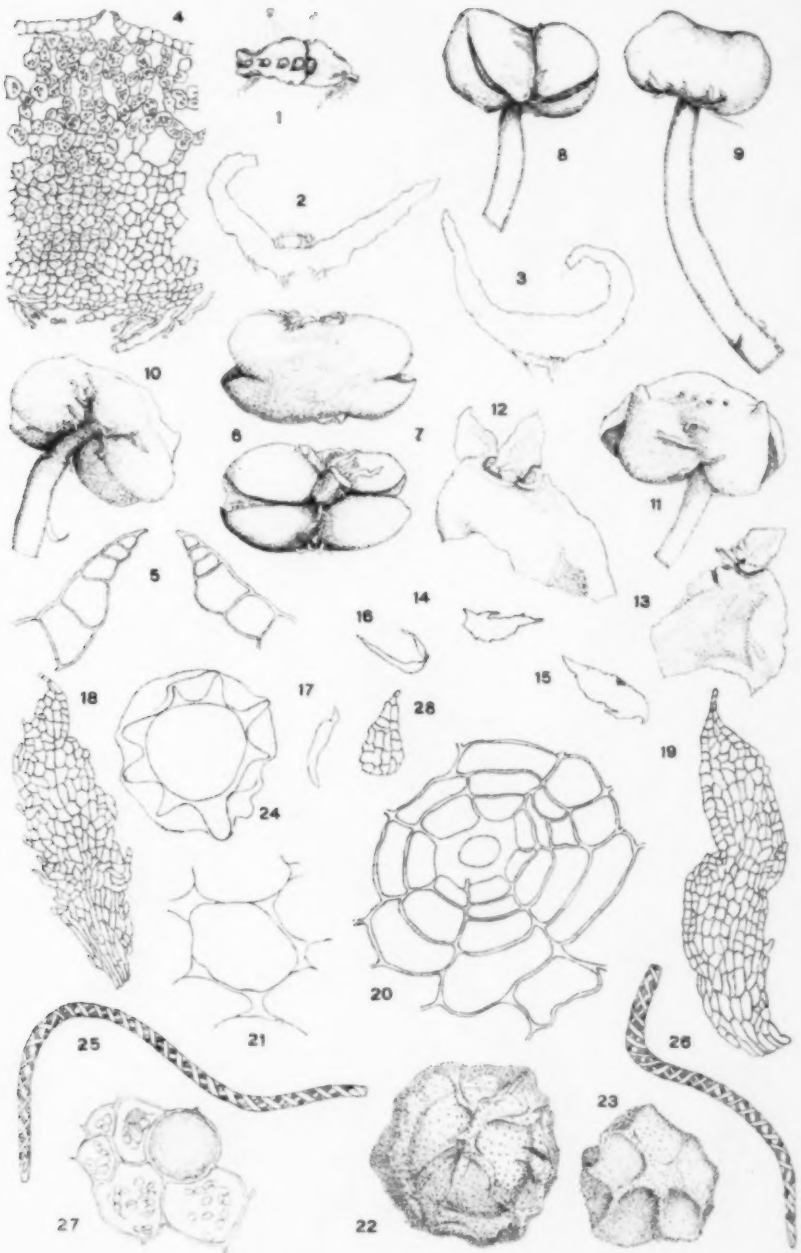
9-20. LOPHOLEJEUNEA HOWEI Evans.

HELIOTYPE CO., BOSTON.



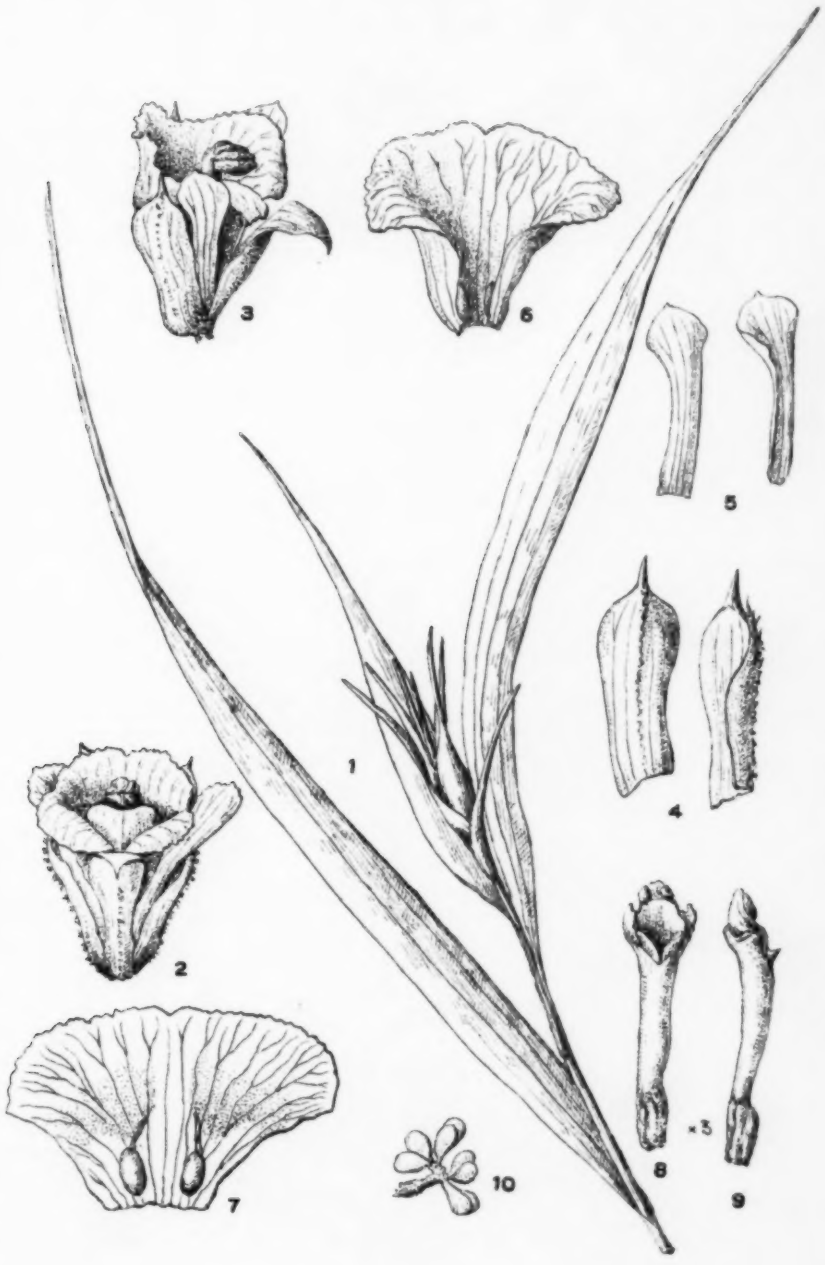
AYTONIA EVANSII Haynes.

HELIOTYPE CO., BOSTON.



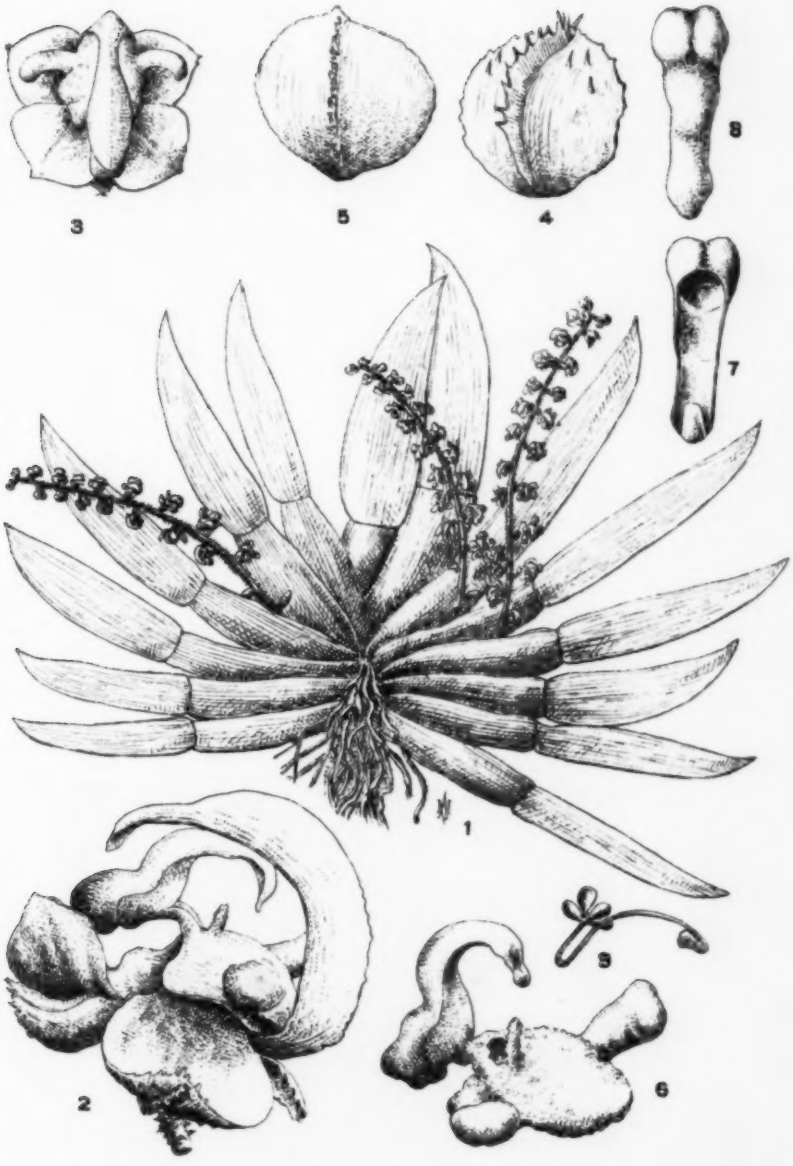
AYTONIA JAMAICENSIS Haynes.

HELIOTYPE CO., BOSTON.



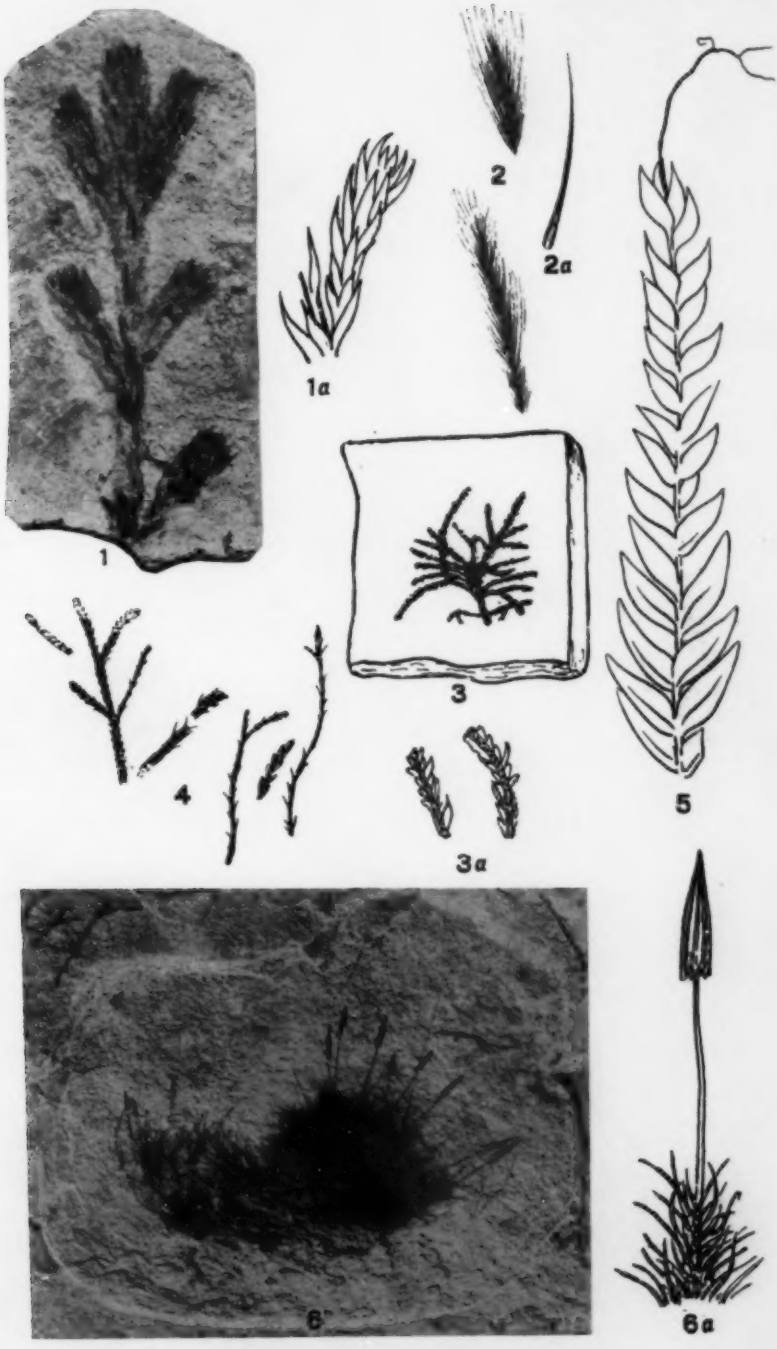
ELLEANTHUS CARICOIDES Nash.

HELIOTYPE CO., BOSTON.

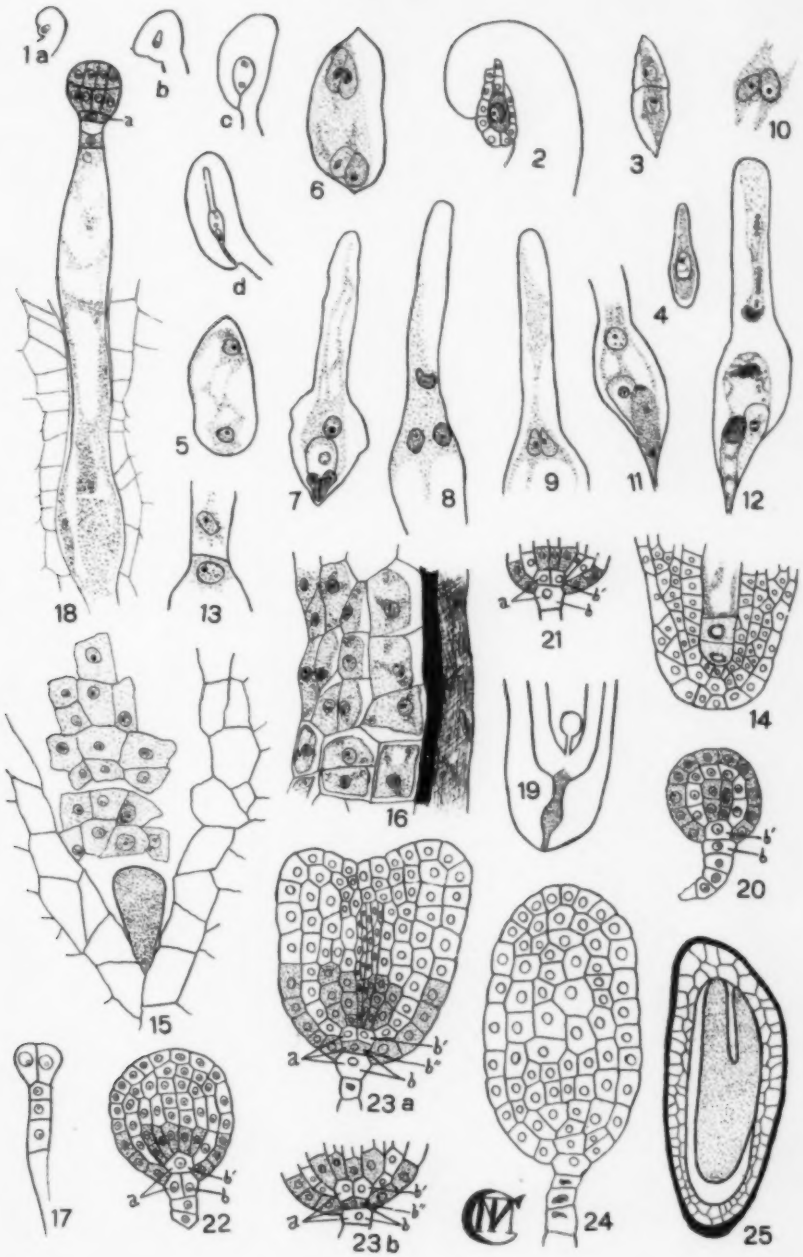


ZYGOSTATES COSTARICENSIS Nash.

HELIOTYPE CO., BOSTON.

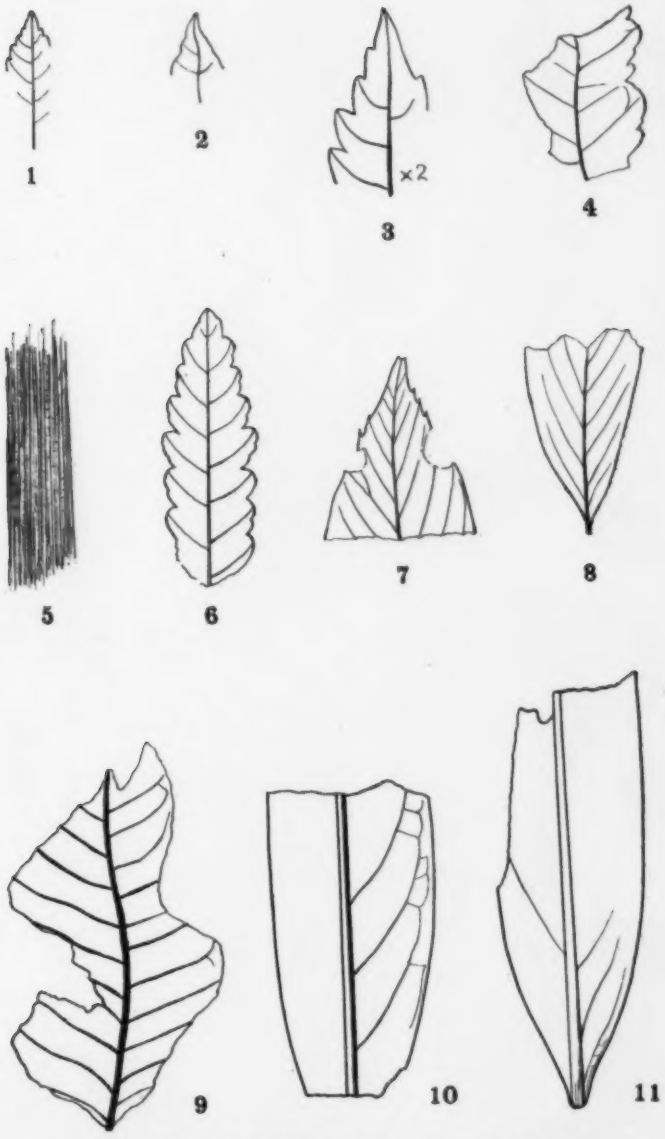


AMERICAN FOSSIL MOSSES



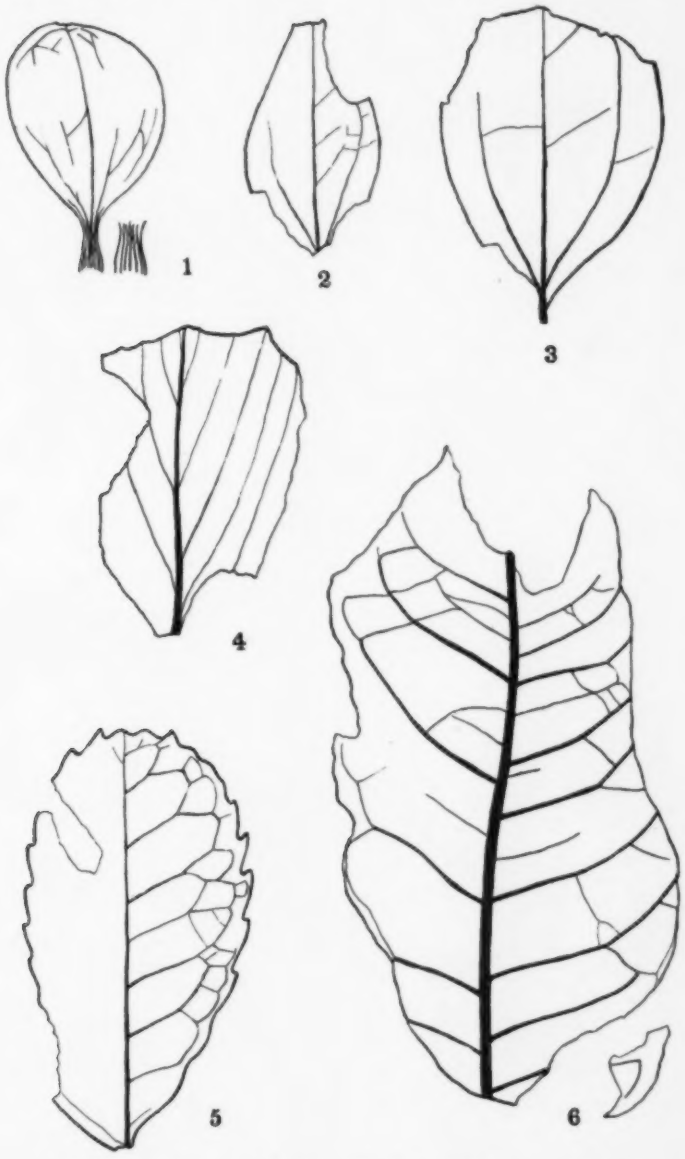
EMBRYOLOGY OF RHYTIDOPHYLLUM

HELIOTYPE CO., BOSTON.



CRETACEOUS PLANTS FROM NORTH CAROLINA

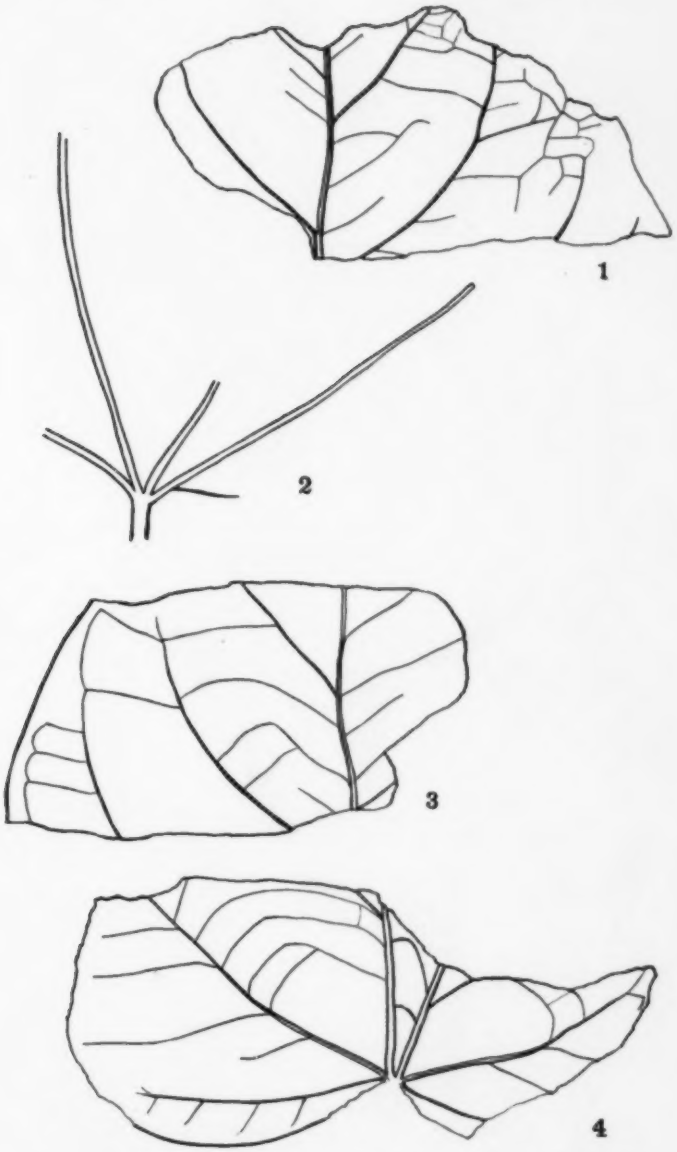
CRETACEOUS PLANTS FROM NORTH CAROLINA



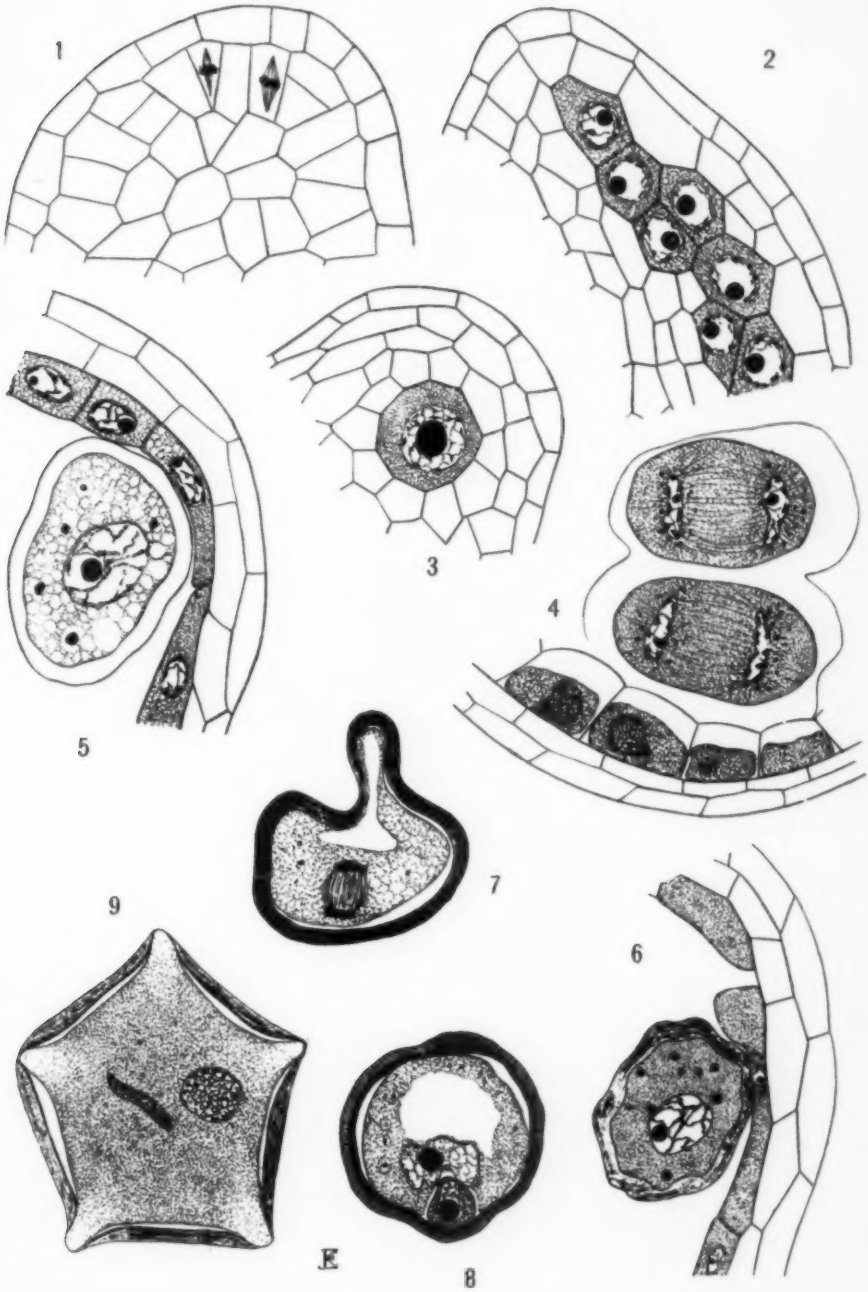
CRETACEOUS PLANTS FROM NORTH CAROLINA

CRETACEOUS PLANTS FROM NORTH CAROLINA

CRETACEOUS PLANTS FROM NORTH CAROLINA

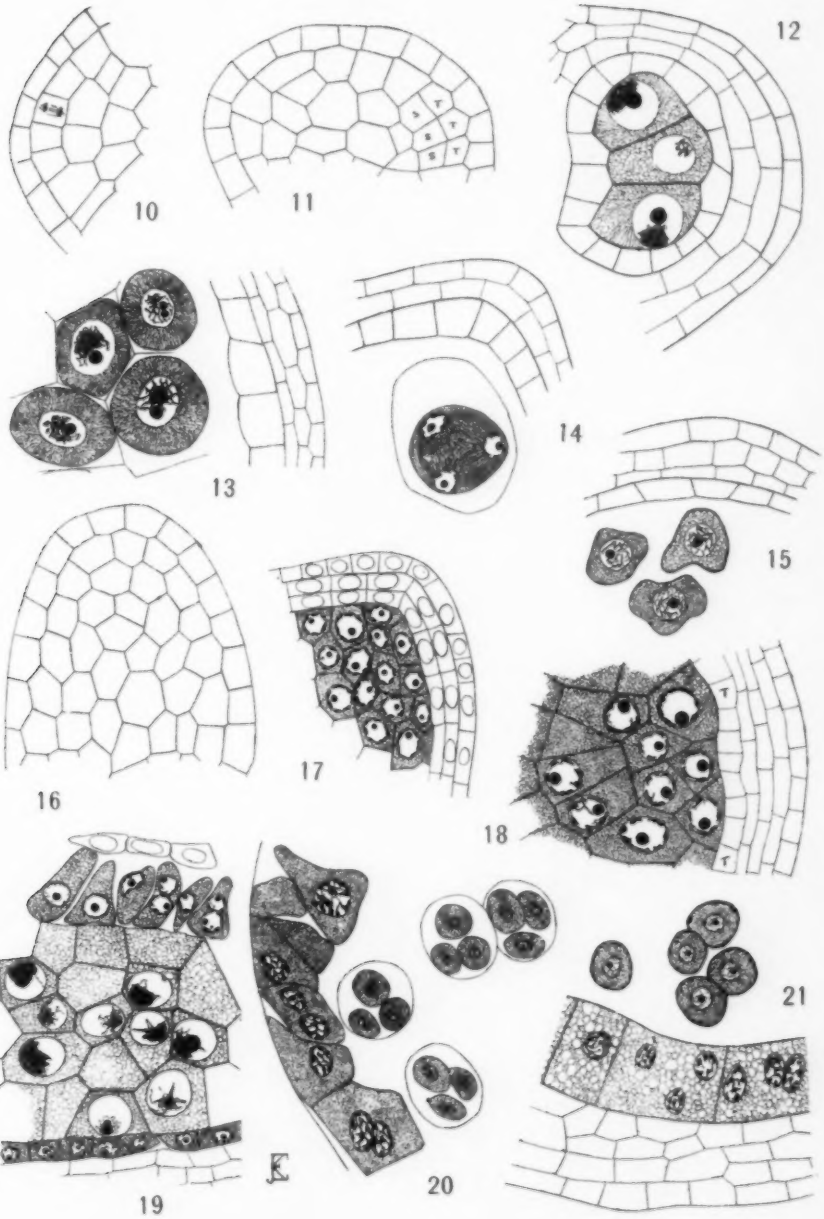


CRETACEOUS PLANTS FROM NORTH CAROLINA



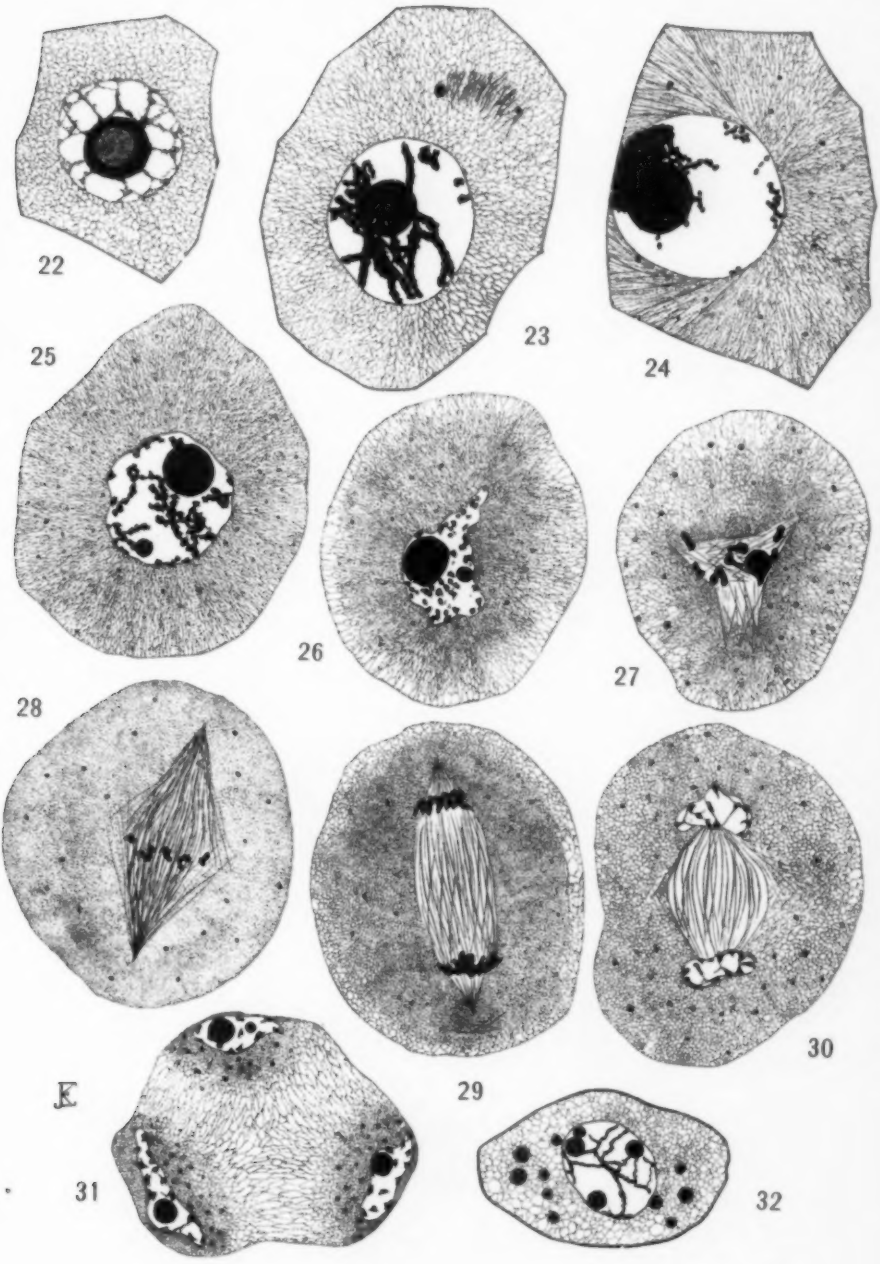
1-9. MICRAMPELIS

HELIOTYPE CO., BOSTON.



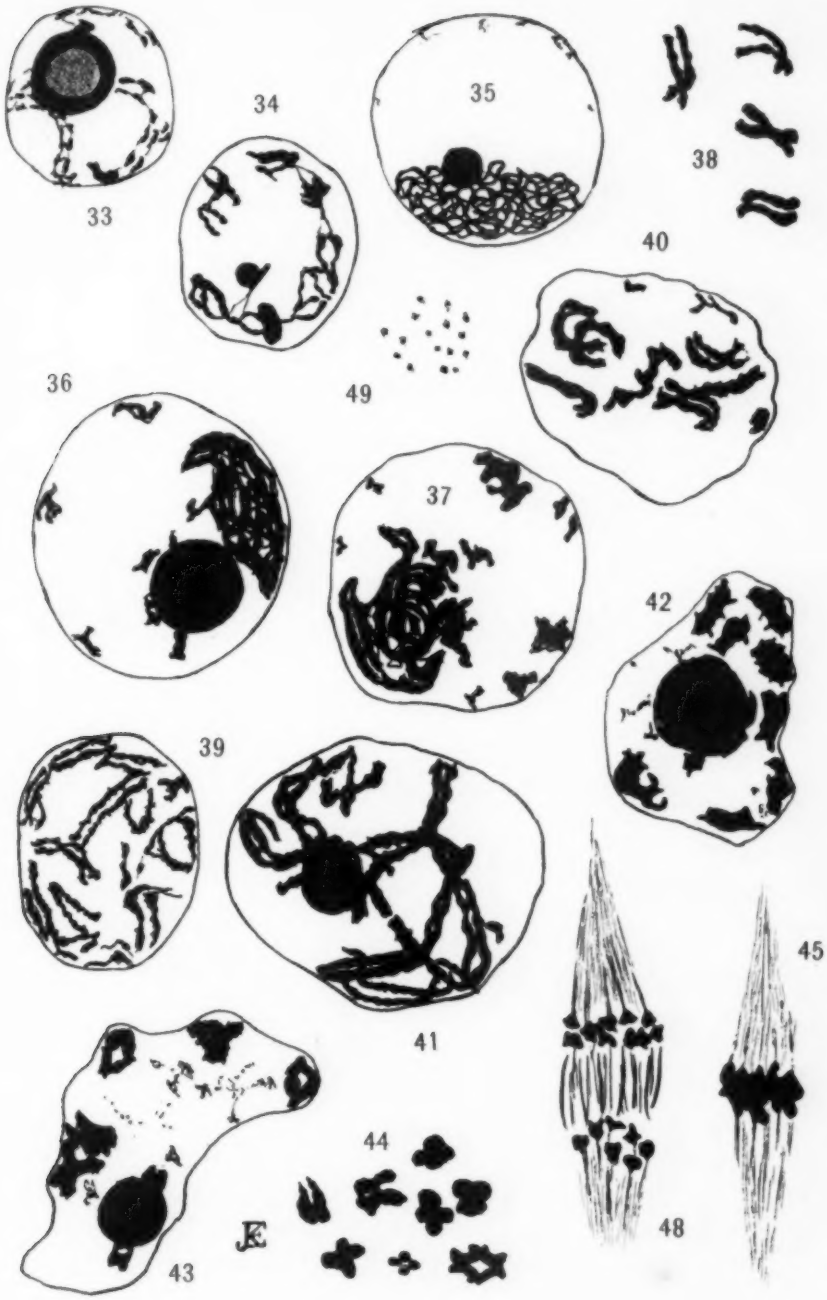
10-15. CYCLANTHERA 16-21. FEVILLEA

HELIOTYPE CO., BOSTON.



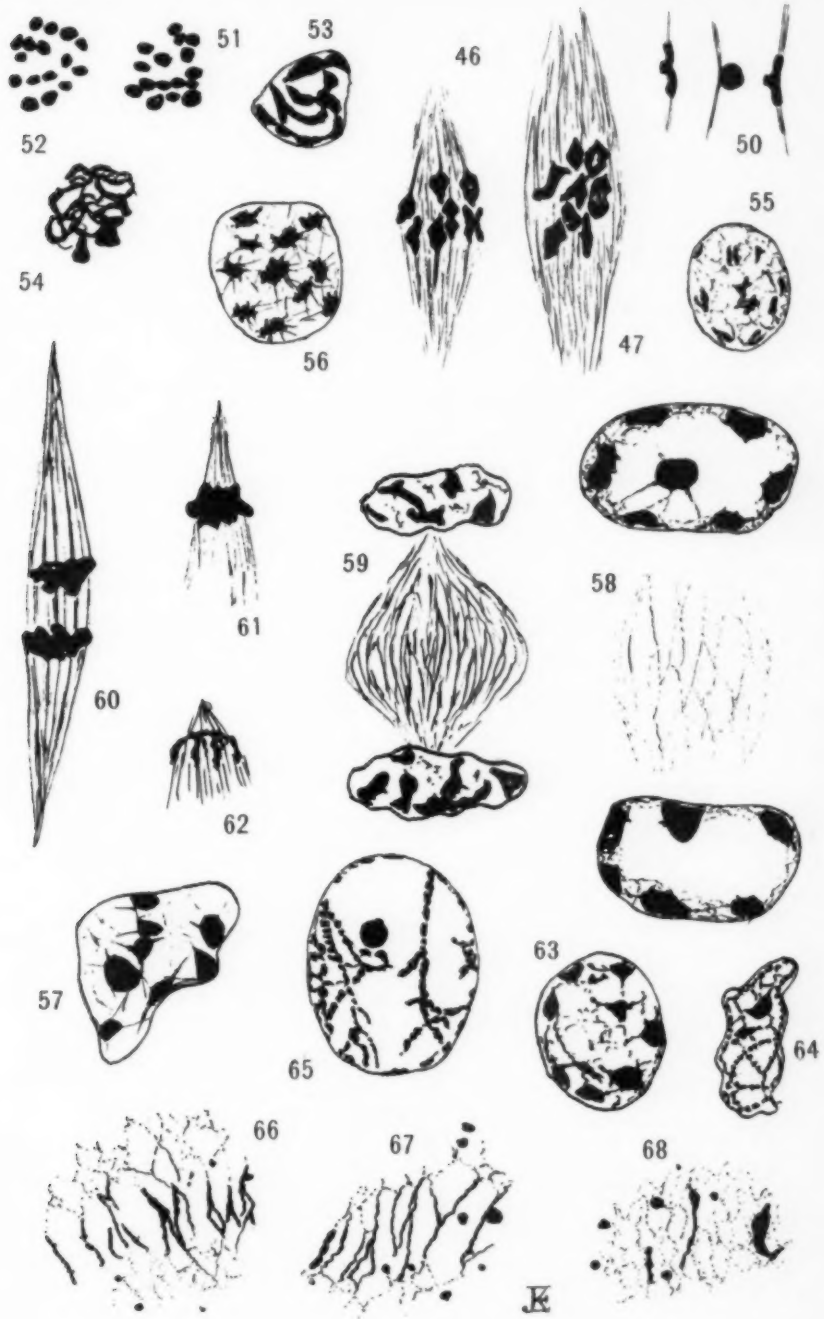
22-32. MICRAMPELIS

HELIOTYPE CO., BOSTON.



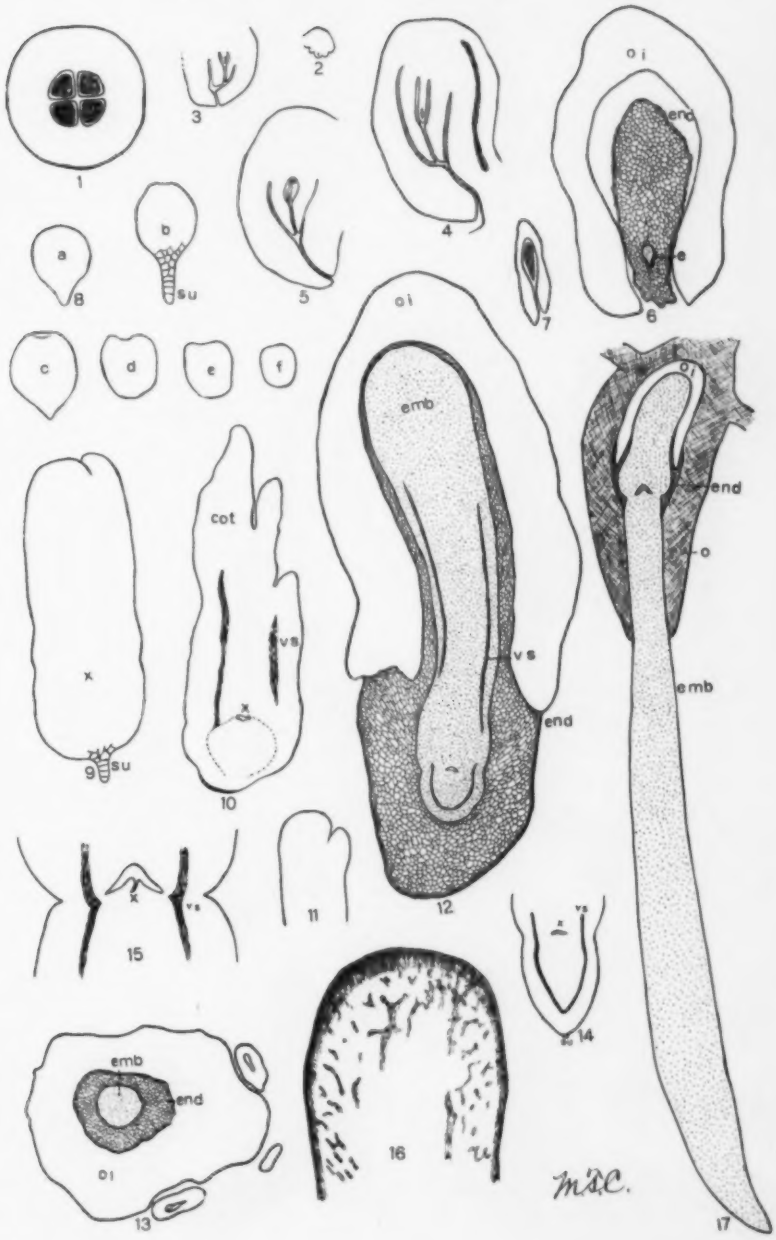
33-49. MICRAMPELIS

HELIOTYPE CO., BOSTON.

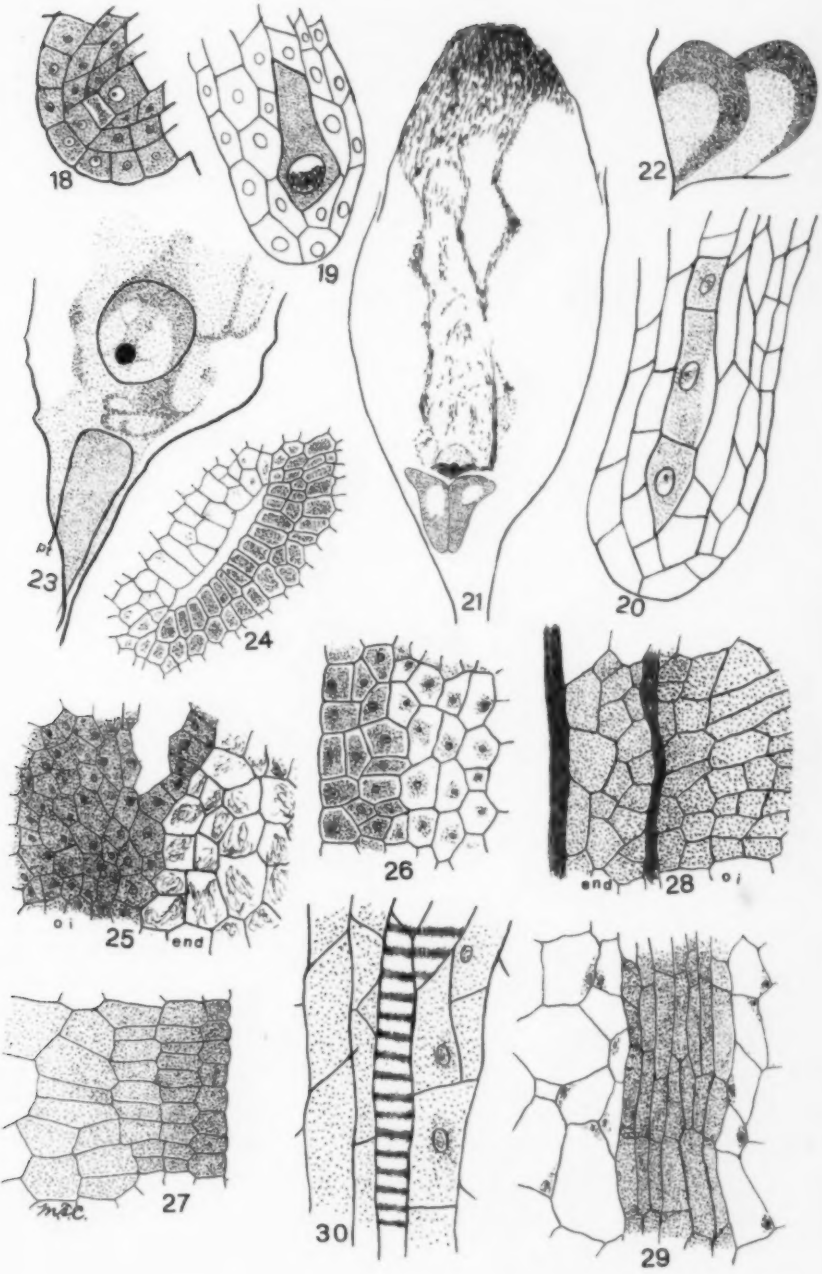


50-68. MICRAMPELIS

HELIOTYPE CO., BOSTON.

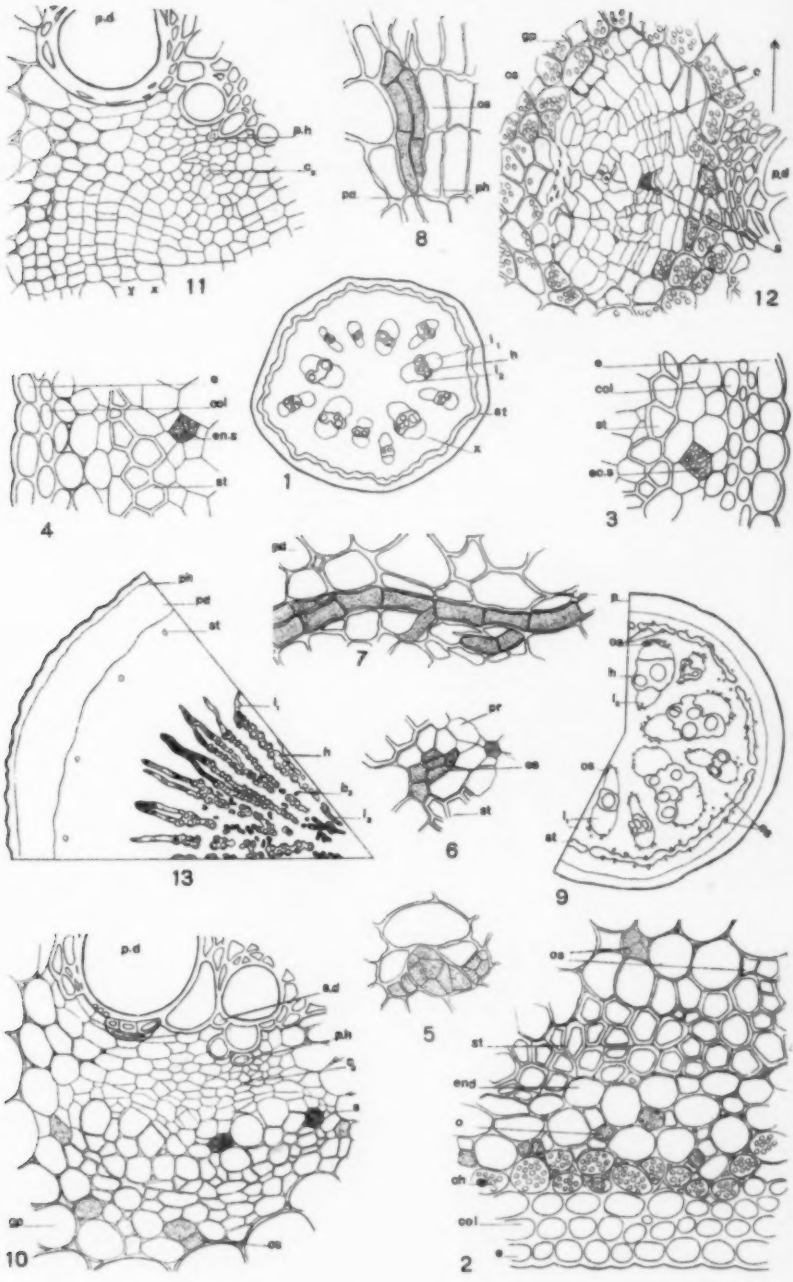


EMBRYOLOGY OF RHIZOPHORA



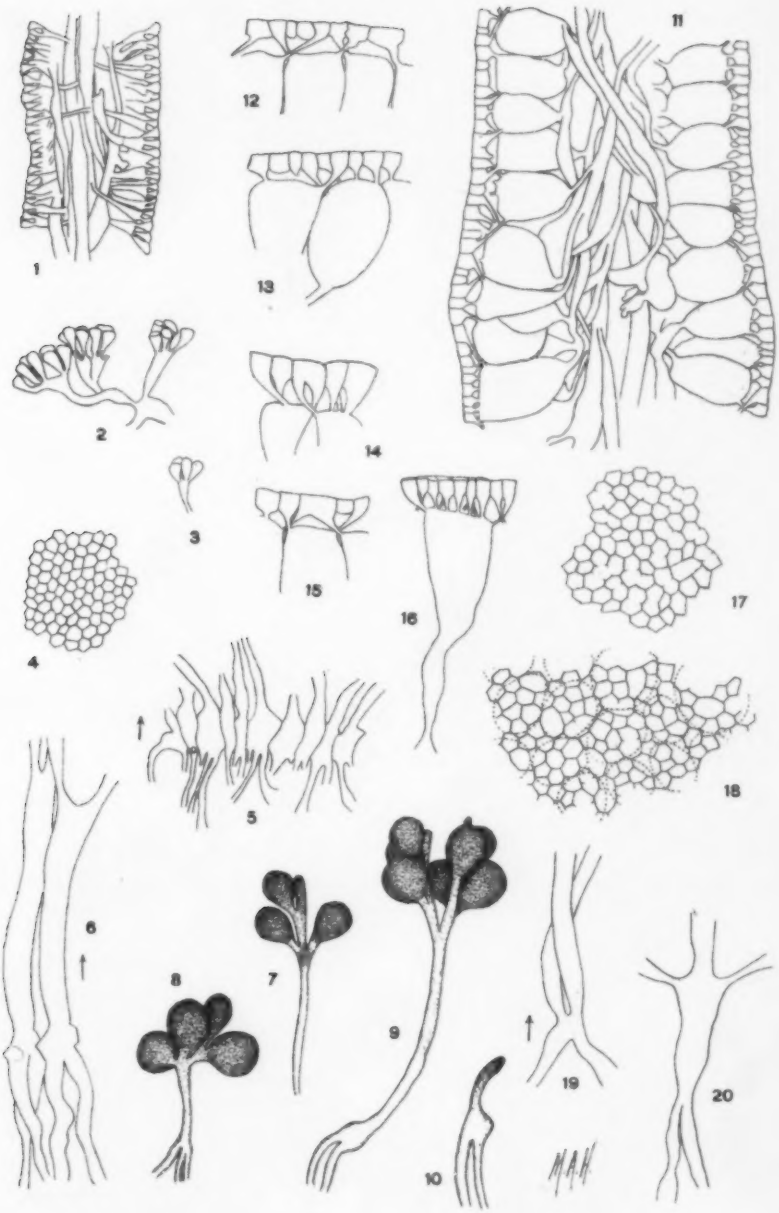
EMBRYOLOGY OF RHIZOPHORA

HELIOTYPE CO., BOSTON.



IBERVILLEA SONORAE

HELIOTYPE CO., BOSTON.



1-10 HALIMEDA TUNA (Ell & Soland) Lamour.
11-20 HALIMEDA DISCOIDEA Decaisne.

COCKAYNE, BOSTON

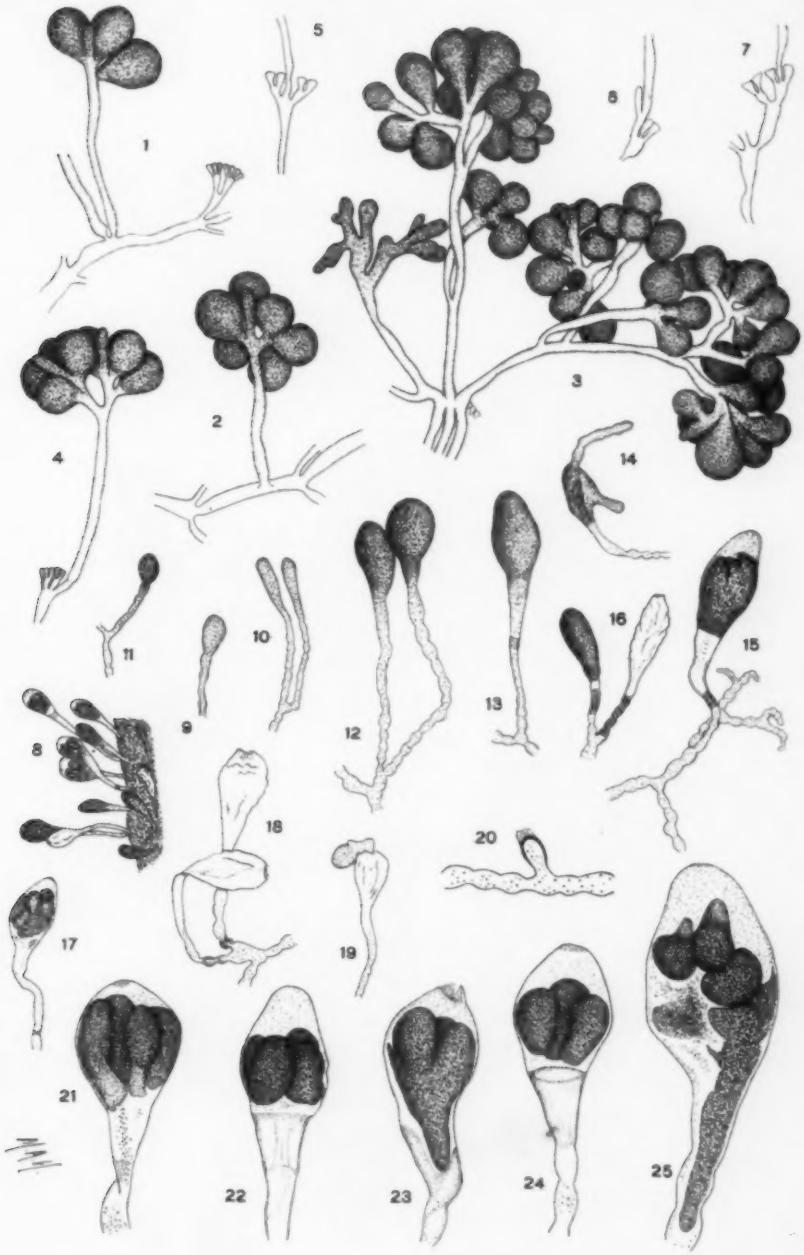
HALIMEDA DISCOIDEA Decaisne

COCKAYNE, BOSTON.

1. HALIMEDA TRIDENS (Ell. & Soland.) Lamour.

2-4. HALIMEDA TUNA (Ell. & Soland.) Lamour.

COCKAYNE, BOSTON.



1 and 2 HALIMEDA TUNA (Ell.& Soland) Lamour.
3-7 HALIMEDA TRIDENS (Ell.& Soland) Lamour.
8-25 AVRAINVILLEA NIGRICANS Decaisne.

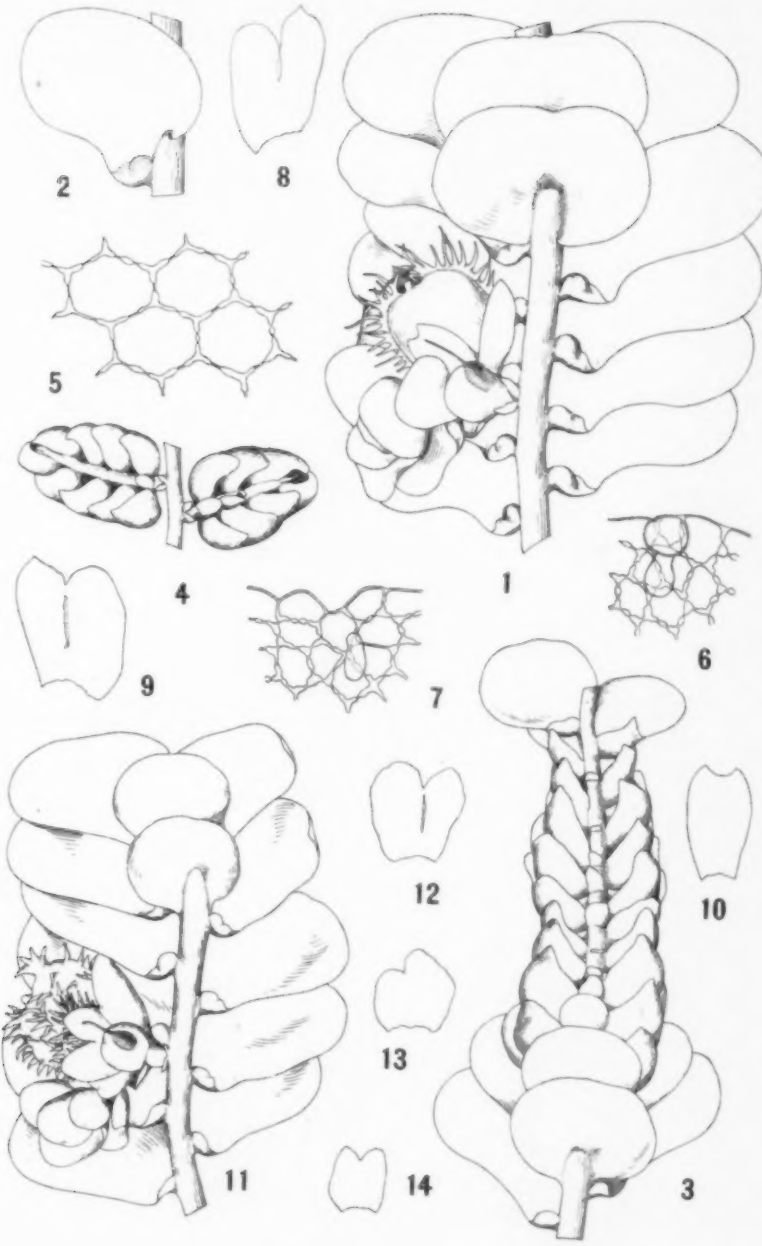
COCKAYNE, BOSTON

COCKAYNE, BOSTON.

HALIMEDA SIMULANS M.A.Howe.

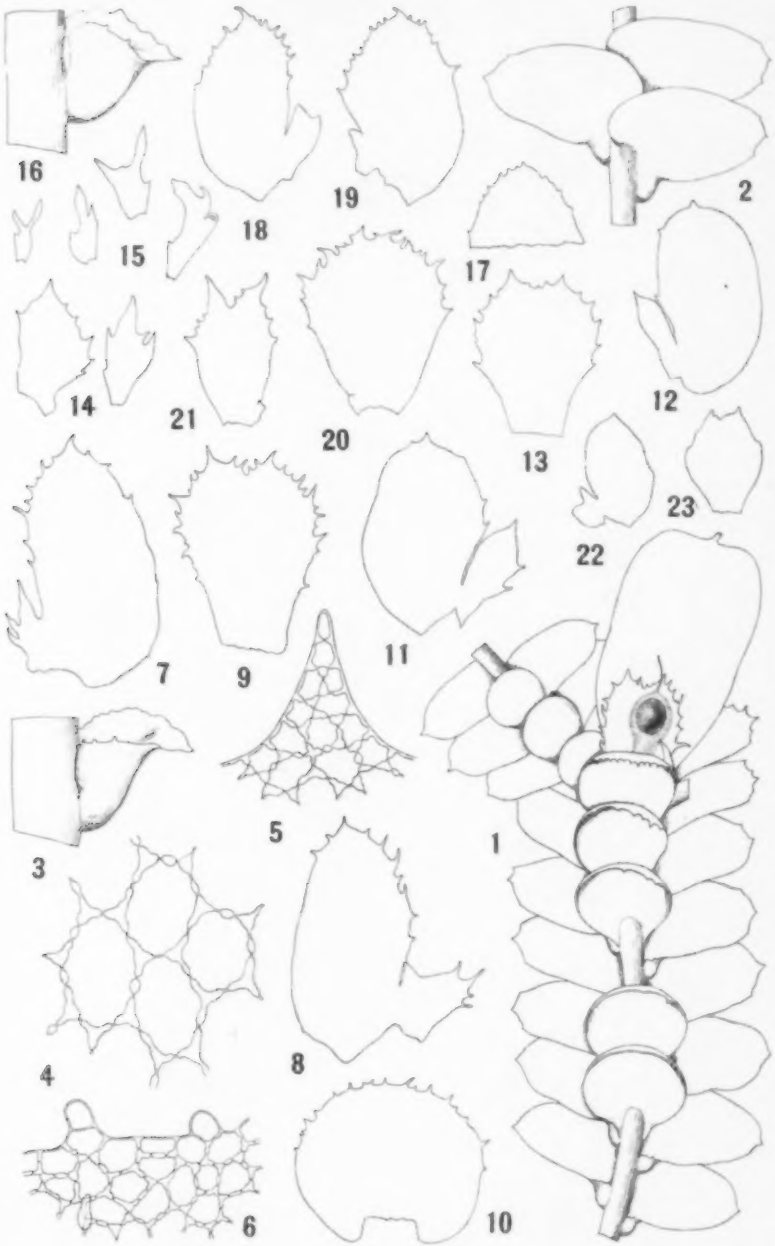
AVRAINVILLEA RAWSONI (Dickie) M. A. Howe.

COCKAYNE, BOSTON.



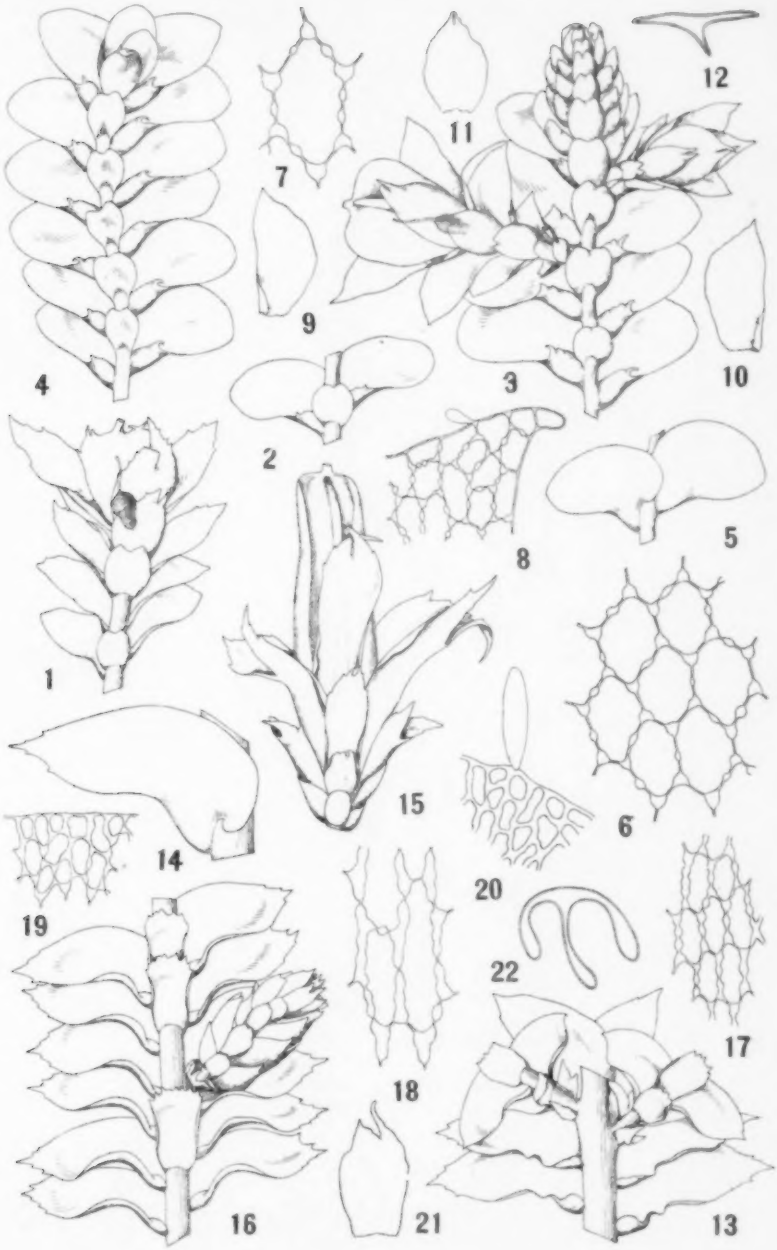
1-10 SYMBIEZIDIUM TRANSVERSALE (Swartz) Trevis.
11-14 SYMBIEZIDIUM BARBIFLORUM (Lindenb. & Gottsche) Evans.

COCKAYNE, BOSTON



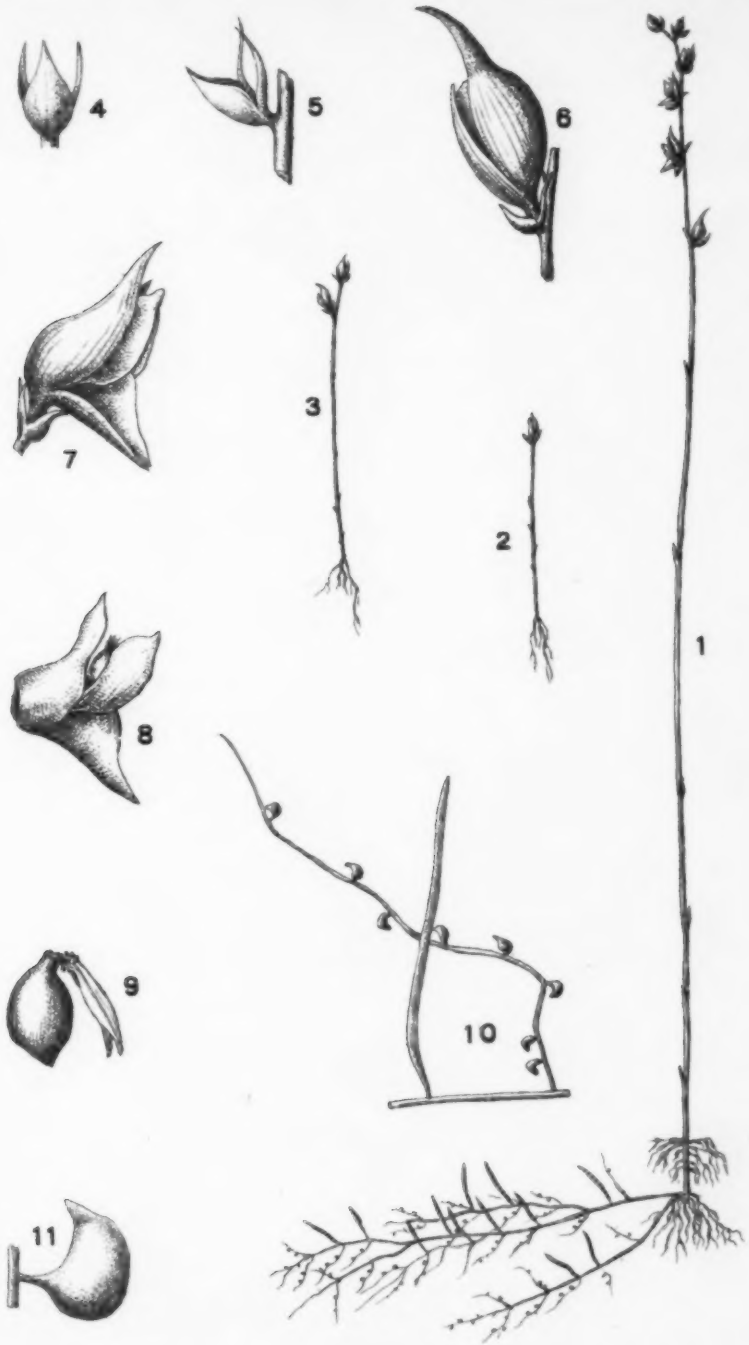
MARCHESINIA BRACHIATA (Swartz) Schiffn.

COCKAYNE, BOSTON



1-12 CAUDALEJEUNEA LEHMANNIANA (Gottsche) Evans.
13-22 BRYOPTERIS FILICINA (Swartz) Nees.

COCKAYNE, BOSTON



UTRICULARIA VIRGATULA Barnhart.

COCKAYNE, BOSTON

VOL. 34 DECEMBER, 1907 NO. 12

GENERAL LIBRARY,
UNIV. OF MICH.
MAR 9 1908

BULLETIN

OF THE

TORREY BOTANICAL CLUB

Editor

JOHN HENDLEY BARNHART

Associate Editors

PHILIP DOWELL
ALEXANDER WILLIAM EVANS
TRACY ELLIOT HAZEN
MARSHALL AVERY HOWE
WILLIAM ALPHONSO MURRILL
HERBERT MAULE RICHARDS
CHARLES BUDD ROBINSON
ANNA MURRAY VAIL

CONTENTS

A new Utricularia from Long Island. (Plate 34.) JOHN HENDLEY BARNHART 579
New species of Uredineae, VI . . . . . JOSEPH CHARLES ARTHUR 583
Notes on a parasitic Gnomonia . . . . . CLAUDE WILBUR EDGERTON 593
A synopsis of the New England species of Tetmemorus. JOSEPH AUGUSTINE CUSHMAN 599
Notes on Carex, III. . . . . KENNETH KENT MACKENZIE 603
INDEX TO AMERICAN BOTANICAL LITERATURE. 609
INDEX TO VOLUME 34. 617

PUBLISHED FOR THE CLUB

THE NEW ERA PRINTING COMPANY
LANCASTER, PA.

THE TORREY BOTANICAL CLUB

President,
HENRY H. RUSBY, M.D.

Vice-Presidents,
EDWARD S. BURGESS, PH.D. LUCIEN M. UNDERWOOD, PH.D., LL.D.

Recording Secretary,
C. STUART GAGER, PH.D.
Botanical Garden, Bronx Park, New York City.

Corresponding Secretary,
JOHN K. SMALL, PH.D.
Botanical Garden, Bronx Park, New York City.

Treasurer,
CARLTON C. CURTIS, Ph.D.
Columbia University, New York City.

MEETINGS

Meetings twice each month from October to May inclusive: the second Tuesday, at 8:00 P.M., at the American Museum of Natural History; the last Wednesday, at 3:30 P.M., in the Museum Building of the New York Botanical Garden.

PUBLICATIONS

All subscriptions and other business communications relating to the publications of the Club should be addressed to the Treasurer, Carlton C. Curtis, Columbia University, New York City.

Bulletin. Monthly, established 1870. Price, $3.00 a year; single numbers 30 cents. Of former volumes, only 24–33 can be supplied separately; certain numbers of other volumes are available, but the entire stock of some numbers has been reserved for the completion of sets. Manuscripts intended for publication in the BULLETIN should be addressed to Dr. John Hendley Barnhart, Editor, New York Botanical Garden, Bronx Park, New York City.

Torreya. Monthly, established 1901. Price, $1.00 a year. Manuscripts intended for publication in TORREYA should be addressed to Dr. Marshall A. Howe, Editor, New York Botanical Garden, Bronx Park, New York City.

Memoirs. Occasional, established 1889. (See last pages of cover.)

Preliminary Catalogue of Anthophyta and Pteridophyta within 100 miles of New York City, 1888. Price, $1.00.

THE BRYOLOGIST

WITH THE JANUARY, 1908, NUMBER BEGINS ITS

ELEVENTH YEAR AND VOLUME

It is a 16–20 page bi-monthly devoted to the study of the Mosses, Hepatics, and Lichens. It is fully illustrated with new, original, and artistic drawings and half-tones. It is indispensable to the working bryologist, professional as well as amateur. Send for sample copy. Subscription price $1.00 a year.

Address, MRS. ANNIE MORRILL SMITH, 78 Orange Street, Brooklyn, N. Y.

INDEX TO AMERICAN BOTANICAL LITERATURE

This Index, printed each month in the BULLETIN, is reissued on library catalogue cards; these are furnished to subscribers at the rate of one cent for each card.

Subscriptions to the card-issue may be addressed to the Treasurer of the Torrey Botanical Club,

WILLIAM MANSFIELD, COLLEGE OF PHARMACY, 115 W. 68th St., N. Y. City.

Beginning with January, 1903, the Index has also been reprinted on paper, on one side only, and can be furnished in that form at the rate of $3.00 a year.

HERBARIUM SPECIMENS DESIRED

especially Pedicularis and allied genera, also Labiatae, Ericaceae, Primulaceae, Ranunculaceae, Cyperaceae and Ferns. Will purchase or give European specimens in exchange. Correspondence solicited. Address:

HENRY DAUTUN,

139 Franklin St., Jersey City, N. J.

North American Flora

THIS work is designed to present descriptions of all plants growing independent of cultivation, in North America, here taken to include Greenland, Central America, the Republic of Panama, and the West Indies, except Trinidad, Tobago, and Curaçao and other islands off the north coast of Venezuela, whose flora is essentially South American.

It will be published in parts at irregular intervals by the New York Botanical Garden through the aid of the income of the David Lydig Fund bequeathed by Charles P. Daly.

It is planned to issue parts as rapidly as they can be prepared, the extent of the work making it possible to commence publication at any number of points. The completed work will form a series of volumes with the following sequence:

Volume 1. Mycetozoa, Schizophyta, Diatomaceae.
Volumes 2 to 10. Fungi.
Volumes 11 to 13. Algae.
Volumes 14 and 15. Bryophyta.
Volume 16. Pteridophyta and Gymnospermae.
Volumes 17 to 19. Monocotyledones.
Volumes 20 to 30. Dicotyledones.

The preparation of the work has been referred by the Scientific Directors of the Garden to a committee consisting of Professors L. M. Underwood and N. L. Britton.

Professor George F. Atkinson of Cornell University, Professors Charles R. Barnes and John M. Coulter of the University of Chicago, Mr. Frederick V. Coville of the United States Department of Agriculture, Professor Edward L. Greene of the United States National Museum, Professor Byron D. Halsted of Rutgers College and Professor William Trelease of the Missouri Botanical Garden have consented to act as an advisory committee.

The subscription price is fixed at $1.50 for each part; it is expected that four or five parts will be required for each volume. A limited number of separate parts will be sold at $2.00 each. Address,

THE NEW YORK BOTANICAL GARDEN

BRONX PARK, NEW YORK CITY

Vol. 7, Part 1, Ustilaginales, including Ustilaginaceae and Tilletiaceae, by G. P. Clinton, was issued Oct. 4, 1906. Vol. 7, Part 2, Coleosporiaceae, Uredinaceae and Aecidiaceae (pars), of the Uredinales, by J. C. Arthur was issued March 6, 1907. Vol. 22, Part 1, including Podostemonaceae by George V. Nash, Crassulaceae by N. L. Britton and J. N. Rose, and Penthoraceae and Parnassiaceae by P. A. Rydberg, was issued May 22, 1905. Vol. 22, Part 2, including Saxifragaceae and Hydrangeaceae by J. K. Small and P. A. Rydberg, Cunoniaceae, Iteaceae and Hamamelidaceae by N. L. Britton, Pterostemonaceae by J. K. Small, Altingiaceae by Percy Wilson and Phyllonomaceae by H. H. Rusby, was issued Dec. 18, 1905. Vol. 25, Part 1, including Geraniaceae by L. T. Hanks and J. K. Small, Oxalidaceae and Linaceae by J. K. Small, and Erythroxylaceae by N. L. Britton, was issued Aug. 24, 1907. Vol. 9, Part 1, Polyporaceae (pars), by W. A. Murrill, was issued Dec. 19, 1907.

ESTABLISHED 185(

EIMER & AMEND

205–211 Third Ave., Corner 18th Street NEW YORK

MANUFACTURERS AND IMPORTERS OF

Chemicals and Chemical Apparatus

Our Specialties

MICROSCOPES and ACCESSORIES

MICROTOMES

BALANCES and WEIGHTS

Sole Agents for

C. A. F. KAHLBAUM'S C. P. Chemicals and Reagents

CARL SCHLEICHER & SCHÜLL'S C. P. Filters

SCHOTT & GENOSSEN'S Famous Laboratory Glassware

And for many other renowned European houses in our line.

COMPLETE LINE OF

Bacteriological Apparatus

WE HANDLE

EVERYTHING NEEDED FOR A LABORATORY

Inspection of premises cordially invited.

PUBLICATIONS BY OFFICERS AND STUDENTS OF THE DEPARTMENT OF BOTANY, COLUMBIA UNIVERSITY

1. MEMOIRS OF THE DEPARTMENT:

Vol. 1. A Monograph of the North American Species of the Genus *Polygonum* (1895). By John Kunkel Small, Fellow in Botany, 1893–1895; Curator of the Herbarium, 1895–1898.

Quarto, 178 pages, 84 plates. Price $6.00.

Vol. 2. A Monograph of the North American Potentilleae (1898). By Per Axel Rydberg, Fellow in Botany, 1896–7.

Quarto, 224 pages, 112 plates. Price $6.00.

2. CONTRIBUTIONS FROM THE DEPARTMENT:

Vol. 1. Nos. 1–25. 1886–1892. Price $5.00.
Vol. 2. Nos. 26–50. 1892–1894. Price $5.00.
Vol. 3. Nos. 51–75. 1894–1895. Price $5.00.
Vol. 4. Nos. 76–100. 1895–1896. Price $5.00.
Vol. 5. Nos. 101–125. 1896–1897. Price $5.00.
Vol. 6. Nos. 126–150. 1897–1898. Price $5.00.
Vol. 7. Nos. 151–175. 1898–1901. Price $5.00.
Vol. 8. Nos. 176–200. 1901–1902. Price $5.00.
Vol. 9. Nos. 201–. 1903–(current).

List of separate numbers available on application.

3. A Text-book of General Lichenology (1896). By Albert Schneider, Fellow in Botany, 1895–1896.

Octavo, 230 pages, 76 plates. Price $4.25 (cloth); $3.80 (paper). Published by Willard N. Clute & Co. Binghamton, N. Y.

The Department invites propositions relative to exchanges of herbarium material for any of the above named publications. Address Dr. Carlton C. Curtis, Columbia University, N. Y. City.

4. An Illustrated Flora of the Northern United States, Canada, and the British Possessions from Newfoundland to the Parallel of the Southern Boundary of Virginia, and from the Atlantic Ocean westward to the 102d Meridian (1896–1898). By Nathaniel Lord Britton, Professor of Botany, 1891–1896; Emeritus Professor 1896–, and Hon. Addison Brown.

Three volumes, royal octavo. Vol. 1, 612 pages; Vol. 2, 642 pages; Vol. 3, 588 pages; 4162 figures in the text, illustrating every species described.

Published by Charles Scribner's Sons, New York. Price, in cloth, $9.00 for the three volumes; with the indexes and keys bound separately, $10.00.

5. Our Native Ferns and their Allies. (Sixth Edition) 1900. By Lucien Marcus Underwood, Professor of Botany, 1896–1907.

Duodecimo, 158 pages, 35 figures. Published by Henry Holt & Co., New York. Price, $1.00.

6. Moulds, Mildews, and Mushrooms. By Lucien Marcus Underwood, Professor of Botany, 1896–1907.

Duodecimo, 236 pages, 10 plates. Published by Henry Holt & Co. Price $1.50.

7. Nature and Development of Plants (1907). By Carlton Clarence Curtis, Assistant in Botany, 1892–1895; Tutor in Botany, 1895–1906; Instructor in Botany, 1906–.

Octavo, 471 pages; 342 illustrations. Published by Henry Holt & Co., New York. Price $3.00.

MEMOIRS OF THE TORREY BOTANICAL CLUB

A series of technical papers on botanical subjects, published at irregular intervals. Price $3.00 a volume. Not offered in exchange.

Vol. 1, No. 1; not furnished separately:

Bailey, Liberty Hyde. Studies of the types of various species of the genus *Carex*. Pages 1–85. 25 My 1889.

Vol. 1, No. 2; not furnished separately:

Martindale, Isaac Comly. Marine algae of the New Jersey coast and adjacent waters of Staten Island. Pages 87–111. 24 Au 1889.

Vol. 1, No. 3; price, 75 cents:

Spruce, Richard. *Hepaticae* Bolivianae, in Andibus Boliviae orientalis, annis 1885–6, a cl. H. H. Rusby lectae. Pages 113–140. 20 Ja 1890.

Vol. 1, No. 4; price, 75 cents:

Sturtevant, Edward Lewis. On seedless fruits. Pages 141–187. 30 My 1890.

Vol. 2, No. 1; not furnished separately:

Halsted, Byron David. Reserve food-materials in buds and surrounding parts. Pages 1–26, *plates 1, 2*. 10 S 1890.

Vol. 2, No. 2; price, 75 cents:

Vail, Anna Murray & Hollick, Charles Arthur. Contributions to the botany of Virginia. Pages 27–56, *plates 3, 4*. 23 D 1890.

Vol. 2, No. 3; not furnished separately:

Holm, Herman Theodor. Contributions to the knowledge of the germination of some North American plants. Pages 57–108, *plates 5–19*. 15 Ap 1891.

Vol. 2, No. 4; price, 75 cents:

Wheelock, William Efner. The genus *Polygala* in North America. Pages 109–152. 30 D 1891.

Vol. 3, No 1; not furnished separately:

Small, John Kunkel & Heller, Amos Arthur. Flora of western North Carolina and contiguous territory. Pages 1–39. 20 F 1892.

Vol 3, No. 2; price, $2.00:

Morong, Thomas. The *Naiadaceae* of North America [with illustrations of all the species]. Pages 1–65, *plates 20–74*. 15 Mr 1893.

Vol. 3, No. 3; not furnished separately:

Rusby, Henry Hurd. An enumeration of the plants collected in Bolivia by Miguel Bang. [Part 1.] Pages 1–67. 28 Ap 1893.

Vol. 4, No. 1; not furnished separately:

Underwood, Lucien Marcus. Index *Hepaticarum*. Part I, Bibliography. Pages 1–91. 10 Je 1893.

Vol. 4, No. 2; not furnished separately:

Small, John Kunkel & Vail, Anna Murray. Report on the botanical exploration of southwestern Virginia during the season of 1892. Pages 93–201, *plates 75–82*. 18 N 1893–17 Ap 1894.

Vol. 4, No. 3; price, 50 cents:

Rusby, Henry Hurd. An enumeration of the plants collected in Bolivia by Miguel Bang. Part 2. Pages 203–274. 10 Mr–17 Ap 1895.

Vol. 4, No. 4; price, 50 cents:

Pettit, Anna Stockton. *Arachis hypogaea* L. Pages 275–296, *plates 83–85* 5 Je 1895.

Vol. 4, No. 5; price, 75 cents:

Rydberg, Per Axel. The North American species of *Physalis* and related genera. Pages 297–374. 15 S 1896.

Vol. 5; price, $3.00:

List of *Pteridophyta* and *Spermatophyta* growing without cultivation in northeastern North America. Pages 1–377. 4 D 1893–31 D 1894.

Vol. 6, No. 1; price, $1.25:

Rusby, Henry Hurd. An enumeration of the plants collected in Bolivia by Miguel Bang. Part 3. Pages 1–130. 17 N 1896.

Vol. 6, No. 2; not furnished separately:

Grout, Abel Joel. A revision of the North American *Isotheciaceae* and *Brachythecia*. Pages 131–210. 30 Jl 1897.

Vol. 6, No. 3; price, 50 cents:

Hazen, Tracy Elliot. The life history of *Sphaerella lacustris* (*Haematococcus pluvialis*). Pages 211–246, *plates 86, 87 (colored)*. 8 Je 1899.

Vol. 6, No. 4; price, 50 cents:

Underwood, Lucien Marcus. A review of the genera of ferns proposed prior to 1832. Pages 247–283. 1 D 1899.

Vol. 6, No. 5; price, 25 cents:

Fink, Bruce. Notes on lichen distribution in the upper Mississippi Valley. Pages 285–307. 1 D 1899.

Vol. 7; price, $3.00:

Howe, Marshall Avery. The *Hepaticae* and *Anthocerotes* of California. Pages 1–208, *plates 88–122*. 5 Au 1899.

Vol. 8, No. 1; not furnished separately:

Lloyd, Francis Ernest. The comparative embryology of the *Rubiaceae*. Part I. Pages 1–26, *plates 1–4*. 26 Au 1899. Part II. Pages 27–112, *plates 5–15*. 15 F 1902.

Vol. 8, No. 2; price, $1.00:

Evans, Alexander William. The *Lejeuneae* of the United States and Canada. Pages 113–183, *plates 16–22*. 15 F 1902.

Vol. 8, No. 3; price, 75 cents:

Britton, Elizabeth Gertrude & Taylor, Alexandrina. The life history of *Vittaria lineata*. Pages 185–211, *plates 23–31*. 30 Au 1902.

Vol. 9; price, $3.00:

Salmon, Ernest Stanley. A monograph of the *Erysiphaceae*. Pages 1–292, *plates 1–9*. 4 O 1900.

Vol. 10; price, $3.00:

Burgess, Edward Sandford. History of Pre-Clusian botany in its relation to *Aster*. Pages i–xii, 1–447. 22 N 1902.

Vol. 11, No. 1; price, $1.75:

Griffiths, David. The North American *Sordariaceae*. Pages 1–134, *plates 1–19*. 30 My 1901.

Vol. 11, No. 2; price, $1.75:

Hazen, Tracy Elliot. The *Ulothricaceae* and *Chaetophoraceae* of the United States. Pages 135–250, *plates 20–42*. 20 O 1902.

Vol. 12, No. 1; price, $1.50:

Northrop, Alice Rich. Flora of New Providence and Andros (Bahama Islands). Pages 1–98, *plates 1–19 + map*. 10 D 1902.

Vol. 12, No. 2; price, $1.00:

Banker, Howard James. A contribution to a revision of the North American *Hydnaceae*. Pages 99–194. 13 Je 1906.

Vol. 12, No. 3; price, 75 cents:

Kupfer, Elsie. Studies in Plant Regeneration. Pages 195–241. 10 Je 1907.

Vol. 13; price, $3.00:

Burgess, Edward Sandford. Species and variations of Biotian Asters, with discussion of variability in *Aster*. Pages i–xv, 1–419, *plates 1–13*. 15 Mr 1906.

Address: **TORREY BOTANICAL CLUB,**
Columbia University, New York City.